



7 DECEMBER 2005

Incorporating Through Change 2, 28 July 2008

Flying Operations

C-5 OPERATIONS PROCEDURES

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: Publications and forms are available on the e-Publishing website at www.e-publishing.af.mil for downloading or ordering.

RELEASABILITY: There are no releasability restrictions on this publication.

OPR: HQ AMC/A37V

Certified by: HQ USAF/XOO
(Maj Gen Teresa M. Peterson)

Supersedes AFI11-2C-5V3, 1 JANUARY 2000

Pages: 233

This instruction implements Air Force Policy Directive (AFPD) 11-2, *Aircraft Rules and Procedures* and references AFI 11-202, Volume 3, *General Flight Rules*, as well as Air Force Tactics Techniques and Procedures (AFTTP) 3-3.35B. It establishes policy for the operation of the C-5 aircraft to safely and successfully accomplish worldwide mobility missions. This instruction applies to Air Force Reserve Command (AFRC) and Air National Guard (ANG) units. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 37-123, (will convert to 33-363) *Management of Records* and disposed of in accordance with the *Air Force Records Disposition Schedule (RDS)* located at <https://afrims.amc.af.mil>. This publication requires the collection and or maintenance of information protected by the Privacy Act (PA) of 1974. The authorities to collect and or maintain the records prescribed in this publication are Title 10 *United States Code*, Chapter 857 and Executive Order 9397, *Numbering System for Federal Accounts Relating to Individual Persons*, 30 Nov 1943. Forms affected by the PA have an appropriate PA statement. System of records notice F011 AF XO, *Aviation Resource Management System (ARMS)* (December 26, 2002, 67 FR 78777) applies. To recommend changes, conflicts, suggestions, or recommendations use the AF IMT 847 and route it through the publishing channels to the OPR for the publication. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

SUMMARY OF CHANGES

This interim change updates lead command designation and 618 TACC redesignation (paragraphs [1.4.2.2.](#), [1.5.2.](#), [1.6.](#), [1.8.](#), [2.1.](#), [2.5.9.3.3.](#), [2.5.9.5.4.](#), [3.9.4.](#), [4.3.2.](#), [5.1.1.](#), [5.15.4.2.](#), [5.18.2.](#), [5.18.5.](#), [5.28.](#), [6.12.4.1.](#), [6.12.4.3.](#), [6.15.1.2.](#), [6.16.](#), [6.28.1.](#), [6.40.](#), [6.45.](#), [6.48.1.](#), [9.3.1.](#), [9.3.1.3.](#), [11.2.3.](#), [11.4.2.3.3.](#), [12.12.1.](#), [12.12.2.](#), [13.2.1.3.](#), [13.10.](#), [13.4.2.1.](#), [14.4.4.](#), and [15.6.1.](#)), updated L-Band system operations (paragraph [2.5.9.](#)), updated Loadmaster crew compliment ([Table 3.1.](#)), added velocity initiative for crew alerting (paragraph [3.11.1.](#)), added risk management to crew release policy (paragraph [3.11.2.4.](#)), added NOTE for one-time flight clarification (paragraph [4.5.1.1.1.](#)), updated Minimum Equipment List ([Table](#)

4.1., Table 4.2., Table 4.4., Table 4.5., Table 4.6, Table 4.7., Table 4.9., Table 4.11., Table 4.13., Table 4.14., Table 4.20., Table 4.21. and paragraphs 4.7., 4.8., 4.9., 4.10.1.), clarified PIC restrictions (paragraph 5.4.3.), re-designated PNF as PM (Table 5.1., Table 5.2., Table 5.3., Table 5.4., Table 5.5., Table 5.8. and paragraphs 5.5., 5.11.1., 5.12.3.1., 5.30.1.3., 5.30.1.4., 5.30.1.1., 5.30.3.1.1., 5.30.3.1.2.1., 5.30.3.2., 5.30.3.2.4., 5.30.3.2.5., 6.38.3.2., 9.6.1.1., 17.11.2., 17.11.3.5.), referred NVG operations to A3V website (paragraphs 5.8.1. through 5.8.6.2.3., corrected FCF guidance (paragraph 5.21.2.1.), deleted Operational Stop checklist reference (paragraph 5.29.1., updated use of automation, FMS 800, and AMP operations (paragraphs 5.30. through 5.31.2.), updated DESC-I-31 (paragraph 6.10.1.2.), deleted AFMAN 24-204 requirement (paragraph 6.10.1.3.), updated Special Departure Procedures (paragraphs 6.16.2.4.1., 6.16.2.4.1.1., 12.2.1.1. through 12.7.5.4.2.5.), updated weather minimums for takeoff (Table 6.3.), corrected T.O. nomenclature (paragraph 6.23.2.), deleted -1 preflight requirement (paragraph 6.24.3.3.), corrected link (paragraph 6.29.7.5.), moved autothrottle use (paragraph 6.32.), updated waypoint data insertion methods (paragraph 6.33.2.), updated GPS overlay approach criteria (paragraph 6.42.9.1.), identified additional requirements for enroute descent or approach (paragraph 6.42.10.), added maintenance opportune training (paragraphs 6.60. through 6.60.3.), updated aviation fuels documentation with proper guidance (paragraph 8.6.), deleted reference (paragraph 12.8.), updated link (paragraphs 12.15.5., 12.16., 13.11.2.), updated fuel conservation procedures (paragraph 14.4.2. through 14.5.2.2.), corrected abbreviations and acronyms and glossary of references and supporting information. A bar (|) indicates revision from the previous edition. The entire text of the IC is the last attachment.

(Introduction)

Chapter 1— GENERAL INFORMATION	14
1.1. General.	14
1.2. Applicability.	14
1.3. Key Words Explained.	14
1.4. Deviations and Waivers.	14
1.5. Supplemental Procedures.	15
1.6. Local Supplement Coordination Process.	15
1.7. Requisition and Distribution Procedures.	15
1.8. Improvement Recommendations and Review.	15
1.9. Definitions.	15
1.10. Aircrew Operational Reports.	15
Chapter 2— COMMAND AND CONTROL	16
2.1. General.	16
2.2. Execution Authority.	16
2.3. Pilot in Command (PIC) Responsibility and Authority.	16
2.4. Mission Clearance Decision.	17
2.5. Operational C2 Reporting.	17

2.6.	Mission Commander (MC).	20
2.7.	Not Used.	20
2.8.	C2 Agency Telephone Numbers.	20
Table 2.1.	618 TACC Mission Controller Phone Numbers.	21
2.9.	Close Watch Missions.	21
2.10.	Law Enforcement Support.	21
2.11.	Enroute Maintenance Support.	21

Chapter 3— AIRCREW COMPLEMENT/MANAGEMENT 22

3.1.	General.	22
3.2.	Aircrew Complement.	22
Table 3.1.	Aircrew Complement.	23
3.3.	Aircrew Member Qualification.	23
3.4.	Pilots.	24
3.5.	Not Used.	24
3.6.	Flight Engineers and Loadmasters.	24
3.7.	Aircrew Management.	24
3.8.	Scheduling Restrictions.	26
3.9.	Counter-Fatigue Management Program.	27
3.10.	Crew Rest/En route Ground Time.	28
3.11.	Alerting Procedures.	30
3.12.	Stage Management.	31
3.13.	Standby Force Duty.	31
3.14.	Orientation Flights and Incentive Flights.	33
3.15.	Interfly.	33
3.16.	Additional Crewmembers (ACM).	33
3.17.	Mission Essential Ground Personnel (MEGP).	34
3.18.	Mission Mobility Observers (MMO).	34

Chapter 4— AIRCRAFT OPERATING RESTRICTIONS 35

4.1.	Objective.	35
4.2.	Minimum Equipment List (MEL) Policy.	35
4.3.	Waiver Protocol.	36

4.4.	Technical Assistance.	36
4.5.	MEL Table Definitions/Column Identifiers.	36
4.6.	C-5 MEL.	37
Table 4.1.	Engines/Auxiliary Power Units (APU).	38
Table 4.2.	Bleed Air, Environmental, Etc. Systems.	41
Table 4.3.	Hydraulics.	45
Table 4.4.	Landing Gear. (Refer to paragraph 4.7.)	47
4.7.	Gear down flight.	49
Table 4.5.	Flight Controls. (Refer to paragraph 4.8.)	50
4.8.	SLATS INOPERATIVE	51
Table 4.6.	Fuel Systems. (Refer to Paragraph 4.9.)	52
4.9.	Fuel System.	54
Table 4.6.	Electrics.	55
Table 4.7.	Instruments.	57
Table 4.8.	Avionics.	58
Table 4.9.	Recording and Emergency Location.	60
Table 4.10.	MADAR. (Refer to Paragraph 4.10.)	61
4.10.	MADAR operational procedures.	61
Table 4.11.	Cargo Door System (Troop & Cargo).	63
Table 4.12.	Oxygen System.	64
Table 4.13.	Warning Systems.	65
Table 4.14.	Fire Suppression System (FSS). (Refer to Paragraph 4.11.)	66
4.11.	FSS Servicing	66
Table 4.15.	Emergency Equipment.	68
Table 4.16.	Miscellaneous Equipment.	69
Table 4.17.	NVG Minimum Operational Equipment	70
Table 4.18.	Avionics Modernization Program (AMP) Instruments	70
Table 4.19.	AMP Avionics	71
Table 4.20.	AMP Flight Controls.	73
Table 4.21.	AMP Lighting	74

Chapter 5— OPERATIONAL PROCEDURES	75
5.1. Checklists.	75
5.2. Duty Station.	75
5.3. Flight Station Entry.	75
5.4. Takeoff and Landing Policy.	76
5.5. Landing Gear and Flap Operating Policy.	76
5.6. Outside Observer/Jump Seat Duties.	76
5.7. Seat Belts.	76
5.8. Aircraft Lighting.	77
5.9. Portable Electronic Devices.	79
5.10. Tobacco Use on Air Force Aircraft.	79
5.11. Advisory Calls.	79
Table 5.1. Nonprecision Approaches.	79
Table 5.2. Precision Approaches.	80
Table 5.3. Visual/Tactical Approaches.	80
Table 5.4. Climb Out.	80
Table 5.5. Descent.	80
5.12. Communications Policy.	81
5.13. Transportation of Pets.	82
5.14. Alcoholic Beverages.	82
5.15. Runway, Taxiway, and Airfield Requirements.	83
Table 5.6. Runway and Taxiway Requirements.	83
5.16. Aircraft Taxi Obstruction Clearance Criteria and Foreign Object Damage (FOD) Avoidance.	84
Table 5.7. Minimum Taxi Clearance Criteria.	85
Table 5.8. Standard Terminology.	86
5.17. Not Used.	87
5.18. Fuel Jettison Procedures.	87
5.19. Aircraft Speed.	88
5.20. Bird/Wildlife Aircraft Strike Hazard (BASH) Programs.	88
5.21. Functional Check Flights (FCFs) and Acceptance Check Flights (ACFs).	89
5.22. Participation in Aerial Events.	90

5.23.	Not used.	90
5.24.	Traffic Alerting and Collision Avoidance System (TCAS).	90
5.25.	Radar Altimeter.	90
5.26.	Not used.	90
5.27.	Reduced Power Takeoffs.	90
5.28.	Aircraft Recovery from Unprepared Surfaces.	90
5.29.	Engines Running Offload or Onload (ERO) Procedures.	90
5.30.	Use of Automation.	91
5.31.	Autopilot and Autothrottle Use.	93

Chapter 6— AIRCREW PROCEDURES 94

Section 6A—Pre-Mission 94

6.1.	Aircrew Uniform.	94
6.2.	Personal Requirements.	94
6.3.	Pre-mission Actions.	95
6.4.	Aircrew Publications Requirements.	95

Table 6.1. Aircrew Publications. 96

6.5.	Airfield Review.	96
6.6.	Aircrew Intelligence Briefing.	96

Section 6B—Predeparture 96

6.7.	Integrated Management Tool (IMT) Account.	96
6.8.	Flight Crew Information File (FCIF).	96
6.9.	Flight Crew Bulletins (FCB).	97
6.10.	Mission Kits.	97
6.11.	Route Navigation Kits.	99

Table 6.2. Route Navigation Kit Contents 99

6.12.	Briefing Requirements.	99
6.13.	Call Signs.	100
6.14.	Instrument Flight Rules.	101
6.15.	Flight Plan/Data Verification.	101
6.16.	Departure Planning.	101
6.17.	Weather Minimums for Takeoff use Table 6.3.	103

Table 6.3. Weather Minimums for Takeoff.	104
6.18. Alternate Planning.	104
6.19. Departure Alternates.	104
6.20. Destination Requirements	105
6.21. Adverse Weather.	105
6.22. Operational Risk Management (ORM).	107
Section 6C—Preflight	107
6.23. AFTO Forms 781 Series.	107
6.24. Aircraft Servicing and Ground Operations.	108
6.25. Aircraft Recovery Away from Main Operating Base (MOB).	110
6.26. Life Support Requirements.	111
6.27. Fleet Service.	111
6.28. Cargo Documentation.	111
6.29. Procedures for Airlifting Hazardous Cargo.	111
6.30. Handling of Classified Cargo, Registered Mail, Mission Capable (MICAP) Parts, Very, Very Important Part (VVIP), Forward Supply System (FSS) Shipments, and Courier Material.	114
Section 6D—Departure	115
6.31. On Time Takeoffs.	115
6.32. Not Used	115
Section 6E—Enroute	116
6.33. Flight Progress.	116
6.34. Navigational Aid Capability.	117
6.35. CIRVIS and Other Reports.	118
6.36. In-Flight Meals.	119
6.37. Communications.	119
6.38. In-flight Emergency Procedures.	119
6.39. Need for Medical Assistance.	120
6.40. Weather Forecasts.	120
Section 6F—Arrival	120
6.41. Descent.	120
6.42. Instrument Approach Procedures.	121

6.43.	NVG Weather Minimums.	123
6.44.	Unscheduled Landings.	123
6.45.	Maintenance.....	124
6.46.	Customs and Border Clearance.	124
6.47.	Insect and Pest Control.	128
Table 6.4.	Spray Chart.	129
Section 6G—Miscellaneous		129
6.48.	Dropped Objects.	129
6.49.	Cockpit Voice Recorder (CVR).	129
6.50.	Life Support and Dash 21 Equipment Documentation.	129
6.51.	Passenger Restrictions.	130
6.52.	Airfield Data Reports.	130
6.53.	Impoundment of Aircraft.	130
6.54.	Not Used	130
6.55.	Wake Turbulence Avoidance.	130
6.56.	Overflying En Route Stops.	131
6.57.	Ordinance Procedures.	131
6.58.	Distinguished Visitor (DV) Airlift.	131
6.59.	Classified Equipment and Material.	131
6.60.	Maintenance Opportune Training.	132
Chapter 7— AIRCRAFT SECURITY		134
7.1.	General.	134
7.2.	Security.	134
7.3.	Air Force Installation Security Program.	134
7.4.	Standby Aircraft Security.	134
7.5.	En Route Security.	135
7.6.	Detecting Unauthorized Entry.	135
7.7.	Preventing and Resisting Hijacking.	136
7.8.	Preventive Measures.	137
7.9.	Initial Response.	137
7.10.	In-Flight Resistance.	138
7.11.	Communications Between Aircrew and Ground Agencies.	138

7.12. Forced Penetration of Unfriendly Airspace.	139
7.13. Arming of Crew Members.	139
7.14. Force Protection.	140

Chapter 8— OPERATIONAL REPORTS AND FORMS 141

8.1. General.	141
8.2. AF IMT 457, USAF Hazard Report.	141
8.3. AF IMT 651, Hazardous Air Traffic Report (HATR).	141
8.4. AMC IMT 97, AMC In-Flight Emergency and Unusual Occurrence Worksheet.	142
8.5. Report Violations, Unusual Events, or Circumstances.	143
8.6. Petroleum, Oil, and Lubricants (POL) - Aviation Fuels Documentation.	145
8.7. Not Used.	147
8.8. AMC Form 54, Aircraft Commander's Report on Services/Facilities.	147
8.9. AMC Form 196, Aircraft Commander's Report on Crew Member.	148
8.10. AMC Form 43, Transient Aircrew Facilities Report.	148
8.11. Not Used.	148
8.12. Not Used.	148
8.13. AF 4096, Airdrop/Tactical Airland/Air Refueling Mission Recap, SKE/ZM Debrief,	148

Chapter 9— TRAINING POLICY 149

9.1. Passengers on Training Missions.	149
9.2. Touch-and-go Landing Limitations.	149
9.3. Training on Operational Missions.	150
9.4. Simulated Emergency Flight Procedures.	150
9.5. Flight Pilot/Copilot Training.	150
9.6. Night Vision Goggle (NVG) Training.	151
9.7. Prohibited In-Flight Training Maneuvers.	151
9.8. Instructor Pilot Briefing.	152
9.9. Debriefing.	152
9.10. Simulated Instrument Flight.	152
Table 9.1. Training Flight Restrictions.	153
9.11. Category II ILS Training.	153
9.12. Manual Gear Lowering.	153

Chapter 10— AIRCREW OPERATIONS IN CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR, AND HIGH-YIELD EXPLOSIVE THREAT ENVIRONMENT	154
10.1. Overview.	154
10.2. Understanding the CBRNE Threat.	154
10.3. CBRNE Passive Defense Measures.	154
10.4. Flight Operations.	156
10.5. Ground Operations.	158
Table 10.1. Task Time Multipliers	159
Table 10.2. Ten-Foot Rule Time Standards (Source: AFMAN 10-2602).	160
Chapter 11— NAVIGATION PROCEDURES	161
Section 11A—Aircrew Procedures	161
11.1. General.	161
11.2. Mission Planning.	161
11.3. Flight Charts.	161
11.4. Navigation Procedures.	161
Section 11B—Low Altitude Navigation Procedures	163
11.5. General.	163
11.6. Mission Planning.	163
11.7. En Route Procedures.	163
Chapter 12— FLIGHT ENGINEER / AIRCREW MAINTENANCE SUPPORT PROCEDURES	165
12.1. General:	165
12.2. Responsibilities.	165
12.3. Authority to Clear a Red X.	165
12.4. Aircraft Servicing and Ground Operations.	165
12.5. Aircraft Structural Integrity Program.	167
12.6. Not Used.	173
12.7. Performance Data, including TOLD Card.	173
12.8. Fuel Planning/Management.	175
12.9. Not Used.	177
12.10. Fault Code Reporting Procedures.	177

12.11. Weight and Balance.	177
12.12. Power-On-Preflight (POP) Program.	177
12.13. Monitoring Primary Radios.	177
12.14. Scanner Duties.	177
12.15. Ground Refueling Procedures with Inoperative Fuel Quantity Indicators:	177
12.16. Wheel and Brake Procedures.	178
Chapter 13— CARGO AND PASSENGER HANDLING PROCEDURES	180
13.1. General.	180
13.2. Responsibilities for Aircraft Loading.	180
13.3. Emergency Exits and Safety Aisles.	181
13.4. Pre-mission Duties.	181
13.5. Passenger Handling.	184
13.6. Over-Packed Meal Procedures:	185
13.7. En-route and Post Flight Duties.	186
13.8. Loaded Weapons.	186
13.9. Weight and Balance.	186
13.10. Cargo Validation Onloading and Offloading Procedures and Format.	187
13.11. Emergency Airlift of Personnel:	187
13.12. Rucksacks:	188
13.13. Flight Station and Troop Compartment Access:	188
13.14. Not Used.	188
Chapter 14— FUEL PLANNING	189
14.1. General.	189
14.2. Scope.	189
14.3. Distribution.	189
14.4. General Planning.	189
Table 14.1. Fuel Planning Requirements.	189
Table 14.2. ACFP Fuel Calculations	192
14.5. AR Fuel Planning.	193
14.6. Variant Configuration Fuel Planning.	193
14.7. Low-Altitude Fuel Planning.	195

14.8.	Not used.	195
Chapter 15— AIR REFUELING (AR)		196
15.1.	General.	196
15.2.	A/R Limitations.	196
15.3.	Communications Failure.	197
15.4.	Operational Reporting.	197
15.5.	MARSA Applicability for Aerial Refueling.	198
15.6.	Altitude Reservations.	198
15.7.	Receiver Aircraft Commander Responsibilities.	198
15.8.	Tanker Aircraft Commander Responsibilities.	199
15.9.	ATC Clearance.	200
Chapter 16— COMBAT MISSION PLANNING		201
16.1.	General.	201
16.2.	Mission Planning.	201
16.3.	Route Planning.	202
16.4.	Low Altitude Restrictions.	202
Figure 16.1.	Inherent Chart Errors.	203
Figure 16.2.	Night VMC En route Altitude.	204
16.5.	Peacetime Route Restrictions.	205
16.6.	Navigation Chart Preparation.	205
16.7.	Aircrew Flimsy.	206
16.8.	Route Study.	206
16.9.	Tactical Aircrew Coordination.	206
16.10.	Briefings.	206
16.11.	Mission Debriefings.	206
16.12.	NVG Mission Planning.	206
Chapter 17— EMPLOYMENT		209
17.1.	General.	209
17.2.	Tactical Airland Checklists.	209
17.3.	Energy Management.	209
17.4.	Tactical Arrival.	209

17.5.	Ground Operations.	210
17.6.	Emergency Airlift of Personnel.	210
17.7.	Tactical Departures.	210
17.8.	DELETED	211
17.9.	DELETED	211
Table 17.1.	DELETED	211
17.10.	DELETED	211
Table 17.2.	DELETED	211
17.11.	NVG Airland.	211
Chapter 18—	AEROMEDICAL EVACUATION (AE)	213
18.1.	Mission.	213
18.2.	Operational Control and Reporting of AE Forces.	213
18.3.	Alerting Procedures.	213
18.4.	PIC Responsibilities.	214
18.5.	Loadmaster Responsibilities.	214
18.6.	AE Crew Responsibilities.	214
18.7.	Ground Operations.	215
18.8.	Refueling Operations.	215
18.9.	Aircraft Configuration.	215
18.10.	Passengers and Cargo.	216
18.11.	Crash/Fire/Rescue.	217
18.12.	AE Call Sign/Use of Priority Clearance.	218
18.13.	Load Message.	218
18.14.	ERO Procedures.	218
18.15.	Forms Prescribed.	218
Attachment 1—	GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION	220

Chapter 1

GENERAL INFORMATION

1.1. General.

1.1.1. This Air Force Instruction (AFI) provides policy for operating the C-5 airplane. It is an original source document for many areas but, for efficacy, restates information found in aircraft flight manuals, flight information publications (FLIP), and other Air Force directives. When guidance in this AFI conflicts with another basic/source document, that document takes precedence. For matters where this AFI is the source document, waiver authority is In Accordance With (IAW) paragraph 1.4. For those areas where this AFI repeats information in another document, follow waiver authority outlined in the basic/source document.

1.1.2. Unit commanders and agency directors involved with or supporting C-5 operations shall make current copies of this AFI available to appropriate personnel. Transportation and Base Operations passenger manifesting agencies will maintain a current copy of this AFI.

1.2. Applicability. This AFI applies to aircrew members, support personnel, and managers involved with employing C-5 aircraft.

1.3. Key Words Explained.

1.3.1. "Will" and "shall" indicate a mandatory requirement.

1.3.2. "Should" indicates a preferred, but not mandatory, method of accomplishment.

1.3.3. "May" indicates an acceptable or suggested means of accomplishment.

1.3.4. "NOTE" indicates operating procedures, techniques, etc., considered essential to emphasize.

1.3.5. "CAUTION" indicates operating procedures, techniques, etc., which could result in damage to equipment if not carefully followed.

1.3.6. "WARNING" indicates operating procedures, techniques, etc., which could result in personal injury or loss of life if not carefully followed.

1.4. Deviations and Waivers. Do not deviate from policies in this AFI except when the situation demands immediate action to ensure safety. The Pilot In Command (PIC) is vested with ultimate mission authority and responsible for each course-of-action they choose to take.

1.4.1. Deviations. The PIC shall report deviations or exceptions taken without a waiver through command channels to their Chief, Major Command (MAJCOM) Stan/Eval who in turn shall notify Chief, AMC Stan/Eval (lead command) as appropriate for follow-on action.

1.4.2. Waivers. Unless otherwise directed, waiver authority for contents of this instruction is the MAJCOM/A3/DO with mission execution authority. Obtain waivers to deviate from provisions in this AFI via MAJCOM Stan/Eval.

1.4.2.1. Permanent waivers affect theater unique circumstances and are enduring in nature. List MAJCOM/A3/DO-approved permanent waivers in the MAJCOM supplement (see para. 1.5.)

1.4.2.2. Long-term waivers affect multiple aircraft/multiple missions but are not permanent in nature (expire at a specific date/time). MAJCOM Stan/Eval shall send HQ AMC/A3V (lead command) copies of MAJCOM/A3/DO-approved long-term waivers.

1.4.2.3. Short-notice waivers are for specific missions in execution. PICs shall use the Waiver Protocol procedure in [Chapter 4](#) to secure MAJCOM/A3/DO approval for short-notice waivers.

1.5. Supplemental Procedures. This AFI is a basic directive. Each user MAJCOM or operational theater may supplement this AFI according to AFD 11-2, *Aircraft Rules and Procedures*, and AFI 33-360, *Publications and Forms Management Program*. Stipulate unique MAJCOM procedures (shall not be less restrictive than this basic document) and publish MAJCOM/A3/DO-approved permanent waivers in the MAJCOM supplement.

1.5.1. Combined Command Operations. Plan and conduct all operations that include forces from multiple MAJCOMs using provisions in this AFI. Do not assume or expect aircrews to perform MAJCOM theater unique procedures without obtaining MAJCOM/A3/DO approval and advance training.

1.5.2. Coordination Process. Forward MAJCOM approved supplements (attach AF Form 673, *Request to Issue Publication*) to HQ AMC/A3V, 402 Scott Dr., Unit 3A1, Scott AFB IL, 62225-5302. Chief, AMC Stan/Eval shall facilitate the HQ AMC/A3 and HQ AFF SA/A3OF approval process.

1.6. Local Supplement Coordination Process. Operations Group commanders (OG/CCs) shall define local operating procedures to this instruction in a unit supplement. OG/CCs shall obtain approval from Numbered Air Force (NAF), if applicable and MAJCOM prior to releasing their supplement. Send an electronic copy of the approved version to HQ AMC/A3V, NAF/DO (if applicable) and MAJCOM/A3/DO.

1.7. Requisition and Distribution Procedures. Unit commanders shall use AFI 36-161, *Distribution Management*, procedures to provide aircrew members and associated support personnel current copies and changes of this AFI.

1.8. Improvement Recommendations and Review. Send comments and suggested improvements to this instruction on an AF Form 847, *Recommendation for Change of Publication*, through channels to HQ AMC/A3V, 402 Scott Drive Unit 3A1, Scott AFB IL, 62225-5302 IAW procedures in AFI 11-215, *Flight Manual Procedures* and MAJCOM Supplement. HQ AMC/A3V will normally lead a MAJCOM level review of this instruction within six months of the publication of a respective AFTTP 3-3.

1.9. Definitions. Find explanations or definitions of terms and abbreviations commonly used in the aviation community in Code of Federal Regulations (CFR) Title 14, Part 1; DoD FLIP General Planning, Chapter 2; and Joint Pub 1-02, *The DoD Dictionary of Military and Associated Terms*. See [Attachment 1](#) for common terms used herein.

1.10. Aircrew Operational Reports. The reporting requirements in this instruction are exempt from licensing IAW paragraph 2.11.10 of AFI 33-324, *The Information Collections and Reports Management Program; Controlling Internal, Public, and Interagency Air Force Information*.

Chapter 2

COMMAND AND CONTROL

2.1. General. The Mobility Air Forces (MAF) command and control (C2) network consists of the following C2 centers: 618 Tanker Airlift Control Center (618 TACC) Global Cell, Pacific Air Forces (PACAF) or United States Air Forces Europe (USAFE) Air Mobility Operation Control Centers (AMOCCs), Air National Guard (ANG) Readiness Center, Air Force Reserve Command (AFRC) Command Center, theater Air and Space Operations Centers (AOC), Air Mobility Division (AMD), Joint Operational Support Airlift Center (JOSAC), Unit Command Posts, Air Mobility Control Centers (AMCC), Contingency Response Groups (CRG), and Special Tactics Teams (STT). C2 centers are action agents for the MAF commander with execution authority (operational control) over mobility missions/forces.

2.2. Execution Authority. Headquarters commanders with command authority over MAF resources hold execution authority for directed missions. Commanders with execution authority formulate plans, allocate assets, and approve missions through a local command post or C2 element. OG/CCs serve as execution authority for local training missions. The pilot in command will execute missions operating outside normal communication channels (use last known mission orders or best course of action).

2.2.1. Off-Station Trainer (OST). Refer to AMCI 11-208, *Tanker/Airlift Operations*, for procedures and requirements governing OSTs.

2.2.1.1. AFRC Current Operations (AFRC/DOOM) is approval authority for AFRC Unit Equipped (UE) OSTs.

2.3. Pilot in Command (PIC) Responsibility and Authority. SQ/CCs shall designate an aircraft commander (AC), instructor pilot (IP), or evaluator pilot (EP) as the PIC for all flights, on a flight authorization form, IAW AFI 11-401, *Aviation Management*, and applicable supplements. An unqualified or non-mission ready pilot may not be designated as PIC. PICs are:

2.3.1. In command of all persons aboard the aircraft.

2.3.2. Vested with authority to accomplish the assigned mission. The PIC shall only fly events authorized in the mission tasking unless in the PIC's judgment an emergency condition demands otherwise. Fly unscheduled training events (for example, air refueling (AR) or transition training) after obtaining approval of the execution authority.

2.3.3. The final mission authority and will make decisions not assigned to higher authority.

2.3.4. The final authority for requesting or accepting aircrew or mission waivers.

2.3.5. Responsible for passing mission progress reports (at least daily) to C2 agents.

2.3.6. Responsible for interaction between aircrew members and mission support personnel and will establish a point-of-contact (POC) with the appropriate C2 agent prior to entering crew rest. Local C2 agents are responsible for coordinating mission support requirements on the PIC's behalf.

2.3.7. Responsible for the welfare of aircrew members, Mission Essential Ground Personnel (MEGP), passengers, and the safe accomplishment of the mission.

2.4. Mission Clearance Decision. The execution authority and PIC shall make the mission clearance decision. In all cases, final responsibility for the safe conduct of the mission rests with the PIC. If the PIC elects to delay a mission, that mission will not depart until the conditions that generated the decision to delay improve or are resolved. Further, no execution authority may task another PIC to take the same mission under the same conditions.

2.4.1. Only re-route or divert a mission when authorized by the execution authority, to resolve an emergency, or if required by en route or terminal weather conditions.

2.4.2. The agent directing the re-route or divert shall ensure the aircraft and aircrew is capable of executing departure, en route, and destination arrival procedures.

2.4.3. The PIC will notify the appropriate C2 agent of any aircraft or aircrew limitation precluding a re-route or divert.

2.4.4. When a C2 agent directs a PIC to fly to an alternate airfield, the agent will ensure existing and forecast weather for the alternate, Notices to Airmen (NOTAMs), and airfield information from the Global Decision Support System (GDSS)/GDSS2/Airfield Suitability and Restrictions Report (ASRR), is suitable. If the alternate becomes unsuitable while en route, coordinate with the C2 agent for other suitable alternates. The PIC is final authority for accepting a suitable alternate. A C2 agent will alert customs and all appropriate ground service agencies to prepare for arrival.

2.5. Operational C2 Reporting.

2.5.1. Stations With MAF C2 Agency. Local MAF C2 agents will enter mission data (arrival, departure, and advisory messages) in the MAF C2 system.

2.5.2. Stations Without MAF C2 Agency. PICs will transmit mission data to the controlling C2 agency by any means available (i.e., DSN, HF, iridium phone, and L-Band SATCOM, etc.). HF radio is the primary method of communication for routine mission information. For critical C2 communications, i.e. aircraft waiver request, maintenance delay, etc., voice communications are the primary method with L-Band SATCOM as the backup.

2.5.3. En route Reporting.

2.5.3.1. Make the following enroute calls to 618 TACC, as required:

2.5.3.1.1. Airborne call when departing from a location without an AMC presence.

2.5.3.1.2. Maintenance call whenever aircraft alpha status changes to code 3.

2.5.3.1.3. On aeromedical evacuation missions, when patient condition changes or arrival time is greater than plus or minus 30 minutes from scheduled. This call must be made at least one hour prior to arrival.

2.5.3.2. CONUS. Periodic “ops normal” calls/transmissions are not required; however, the controlling C2 agency may increase reporting requirements.

2.5.3.3. OCONUS. MAJCOM C2 agencies will specify increased reporting procedures through a communications plan in the OPLAN, OPORD, FRAG, Mission Directive, or FLIP. Aircrews will maintain listening watch in accordance with the communications plan within aircraft equipment capabilities (e.g. HF-Automatic Link Establishment (HF-ALE), L-Band SATCOM).

2.5.4. Aircraft Status/Maintenance Discrepancy Reporting. PICs shall report aircraft system malfunctions traditionally requiring extensive troubleshooting as soon as feasible. Contact arrival C2 agency if available, otherwise contact MAJCOM C2 for relay.

2.5.5. Air Refueling Mission Reports.

2.5.5.1. Receiver AR Report. On operational missions, PICs shall report the AR information to the destination C2 agency after landing. C2 agencies will enter the information in the MAF C2 system for missions under their control. The MAJCOM C2 agency will enter the data for all missions. Include all scheduled ARs not accomplished. Use the following format

2.5.5.1.1. AR track.

2.5.5.1.2. Scheduled On-load.

2.5.5.1.3. Actual Onload.

2.5.5.1.4. Reason Code.

2.5.5.1.5. Additional Comments.

2.5.5.2. Reason Codes. Reason codes indicate the outcome of air refueling activity. Codes are normally used when a problem or situation affects the successful accomplishment of the air refueling. The Reason Code "AC" will be used when air refueling was complete without delay or mission impact. Additional comments are mandatory for all reason codes except AT, WX, and AC.

2.5.5.2.1. RO-Receiver Operations.

2.5.5.2.2. RM-Receiver Maintenance.

2.5.5.2.3. RW-Receiver Weather.

2.5.5.2.4. TO-Tanker Operations.

2.5.5.2.5. TM-Tanker Maintenance.

2.5.5.2.6. TW-Tanker Weather.

2.5.5.2.7. AT-Air Traffic Control.

2.5.5.2.8. WX-Air Refueling Track Adverse Weather.

2.5.5.2.9. AC-Air Refueling Complete.

2.5.6. "Thirty Minute" Out Call. Transmit a UHF or VHF arrival advisory to the destination C2 agency approximately 30 minutes prior to arrival. Provide Estimated Time in Blocks (ETB).

2.5.7. Integrated Flight Management (IFM) Sorties. On IFM sorties the flight managers (FM) will be the C2 conduit for aviators. For critical C2 communications, voice communications (HF, DSN, iridium phone, etc.) are the primary method.

2.5.7.1. Position Reporting on IFM Missions. IFM missions transiting oceanic flight information regions (FIRs) need to add the phrase "Pass to Hilda" to ATC position reports. Crews may also use the ARINC frequencies listed in the aircrew flimsy for C2 phone patch requirements. Use ARINC phone patch only after exhausting normal communication methods.

2.5.8. High Frequency (HF) Communications. HF is the primary means of access to the worldwide C2 network.

2.5.8.1. The secondary HF radio should be operated in Automatic Link Establishment (ALE) mode to support voice contacts between the PIC and MAJCOM C2.

NOTE: Run the ALE system in the silent mode during flights where pilots use the HF radio system for communication with ATC.

2.5.9. L-Band SATCOM. L-Band SATCOM provides a worldwide communications capability (secondary to HF). L-band SATCOM may be used for routine communication if the message is *unclassified*. Due to the large volume of traffic, MAJCOM C2 will only forward messages when specifically requested. In this case, the L-Band message to MAJCOM C2 must include, "Relay, no C2 agent (or negative HF contact) at (include station name)" in the message remarks. The AERO-I SATCOM system should be used for routine communication on AMP modified airplanes.

2.5.9.1. Employment. Limit SATCOM communications to operational traffic. Turn the transceiver and laptop on during preflight and leave it configured to transmit and receive messages until aircraft power down at destination. For missions operating through sensitive or classified locations disable the Global Positioning System (GPS) position-reporting feature.

2.5.9.2. Home Station. Operations groups will be responsible for storing, maintaining day-to-day control, and administrative accountability of computers.

2.5.9.3. En route. Issue one laptop to each PIC; including stage crews.

2.5.9.3.1. Laptops may be secured aboard aircraft which have been modified with a suitably secure container. On aircraft lacking a suitable secure container, computers will be stored in the command post or other suitable MAF C2 Center.

2.5.9.3.2. Laptops will stay with the crew, not airplane. **EXCEPTION:** For unit deployments, deployed commanders may develop alternate laptop transfer procedures for deployed aircrews.

2.5.9.3.3. L-Band shortage/outage. Aircrew departing home station without a computer will inform 618 TACC. En route, aircrew will continue to inform 618 TACC concerning lack of L-Band prior to the first flight of the day.

2.5.9.4. Staging Operations. Control procedures should ensure crews maintain original laptop computer issued by home station. Do not store laptop computers on aircraft during staging operations.

2.5.9.5. L-Band SATCOM Messages and Advisories.

2.5.9.5.1. On-station Message. Transmit an on-station message at the beginning of each crew duty day.

2.5.9.5.2. Arrival Advisory. IAW paragraph [2.5.6](#).

2.5.9.5.3. Advisories. Transmit (free-text messages) mission delay, in-flight refuel, on/off-load reports.

2.5.9.5.4. When using L-Band SATCOM, include "618 TACC please confirm addressee received this message," in remarks field.

2.5.10. AERO-I. AERO-I voice is a backup for the Controller to Pilot Datalink Communication (CPDLC) and C2 communications (datalink and VHF/HF voice). Certain C2 agencies and ATC units may be selected for calling from the AERO-I directory.

2.5.10.1. AERO-I voice may not be used for routine communications with ATC or for personal use. It should be used for ATC communication only as a backup to CPDLC or as otherwise instructed. AERO-I voice may be required as a backup to CPDLC on certain CNS routes.

2.5.11. DV Messages. Airborne unclassified messages originated by DV passengers may be transmitted at the discretion of the PIC.

2.5.12. Iridium Phone. The purpose of this telephone is for worldwide connectivity with C2, including the ability for secure communications. Ensure your Iridium phone number is available to C2 agencies by having it published in GDSS (GDSS2).

2.5.13. AOC Datalink. AOC datalink is another non-secure means of communications for routine mission movement information to C2. Additionally, the AOC message set includes the capability to send/receive non-routing information such as a divert request.

2.6. Mission Commander (MC).

2.6.1. Unit commanders shall designate a MC when more than two aircraft are assembled to perform missions away from home station. Unit Commander should consider appointing a MC for special, high-visibility missions (i.e. CAPSTONE, DV2, etc). The MC has overall responsibility and is the final authority for decisions that impact mission execution. The MC shall properly coordinate mission details. For flight-managed sorties, MC shall coordinate any special mission planning requirements with the IFM mission allocator not later than 24 hours prior to mission execution.

2.6.1.1. For MAJCOM-tasks missions, MAJCOM/A3/DO will coordinate and designate a lead planning agency when more than one unit is involved in an A/R or tactical airland operation. For theater airlift missions with more than one airlift unit involved, the theater AOC shall designate a central planning agency responsible for coordinating the entire mission with all involved agencies. The OG/CC for the lead planning agency will designate a MC. The MC will be a rated (normally field grade) officer qualified in the type mission.

2.6.1.2. The MC will ensure all collocated aircrew members attend required briefings.

2.6.1.3. When non-collocated, the MC (in conjunction with the lead planning agency) will ensure non-collocated aircrew members receive applicable information, to include rendezvous, formation, abort, and recovery procedures. The MC will provide controlling agency and all non-collocated PICs anticipated delays or mission changes.

2.7. Not Used.

2.8. C2 Agency Telephone Numbers. **Table 2.1.** contains a list of 618 TACC phone numbers. Crewmembers may also use the 618 TACC toll-free number, 1-800-AIR-MOBL, to contact other offices within the 618 TACC, including flight managers.

Table 2.1. 618 TACC Mission Controller Phone Numbers.

TYPE OF MISSION	618 TACC PHONE NUMBER
Contingency and Air Refueling	DSN 779-0320
Channel	DSN 779-0321
JAATT	DSN 779-0322
SAAM and Exercise	DSN 779-0323
All Other	DSN 779-0324

2.9. Close Watch Missions. Close Watch missions (for example, Combat Search and Rescue (CSAR), Aeromedical Evacuation (AE), PHOENIX BANNERS) receive special C2 attention. PICs will promptly notify appropriate C2 agency of delays, aborts, or other events that affect on-time departure. Provide the C2 agent the estimated time in commission (ETIC), planned ETD, and estimated time of arrival (ETA) within 10 minutes of the event or as soon as safety allows.

2.10. Law Enforcement Support. It is the policy of the Department of Defense (DOD) to cooperate with civilian law enforcement officials to the maximum extent practicable. AFI 10-801, *Assistance to Civilian Law Enforcement Agencies*, provides the policies and procedures service members must follow when supporting federal, state, and local civilian law enforcement agencies. Coordinate all civilian law enforcement authorities' requests for assistance through appropriate C2 channels.

2.11. Enroute Maintenance Support. 618th TACC/XOCL will support all mobility aircraft requests for parts and/or maintenance assistance regardless of type of mission or component. Refer to paragraph 2.8. for 618th TACC telephone numbers.

Chapter 3

AIRCREW COMPLEMENT/MANAGEMENT

3.1. General. This chapter provides guiding principles to form/manage mobility aircrews. Commanders at all levels shall follow this policy to form aircrews and to develop aircrew-related work/rest schedules that optimize efficiency of mobility forces engaged in worldwide operations.

3.2. Aircrew Complement. SQ/CCs shall form aircrews based on fragmentation order/mission directive, Crew Duty Time (CDT) and Flight Duty Period (FDP) requirements, aircrew member qualifications, and other constraints to safely accomplish the mission tasking. Total operating crew will not exceed 22.

Table 3.1. below summarizes crew position requirements for different crew types.

3.2.1. The minimum aircrew member complement for a local training flight is the same as for a basic crew. **EXCEPTION:** Loadmasters are only required on locals carrying passengers or cargo. **NOTE:** Ballast for SCM-modified aircraft is not considered cargo. When a mission requires more than one aircrew member at a position, the SQ/CC will determine whether an instructor and NMR crewmember meet mission requirements.

3.2.2. SQ/CCs shall form augmented aircrews for missions planned to take longer than a basic CDT. Augmenting aircrew members must be current, qualified, and Mission Ready (MR) IAW AFI 11-2C-5V1, *C-5 Aircrew Training*. **EXCEPTIONS:** A NMR pilot (non-current, qualified) may be used as an augmentee provided the PIC is a fully qualified, MR instructor and the NMR (non-current) pilot is regaining currency (e.g., overseas sortie). SQ/CC shall augment an aircrew for the full Flight Duty Period (FDP). The MAJCOM/A3/DO may augment aircrews while the flight is underway. (see paragraph 3.11., Aircrew Management, for more on CDT/FDP.)

Table 3.1. Aircrew Complement.

Crew Position	Crew Complement	
	Basic	Augmented
Aircraft Commander (see notes 1,2)	1	1
Pilot (see notes 1,2)	1	2
Flight Engineer (see notes 3,4)	2	2
Loadmaster (see notes 5,6,7,8)	2	3
<p>NOTES:</p> <ol style="list-style-type: none"> 1. A basic crew requires an aircraft commander and another pilot. An augmented crew requires an aircraft commander and two pilots. NVG crews require an aircraft commander and two pilots for both basic and augmented crews. 2. On AR missions, an aircraft commander and flight engineer will be AR-qualified. Another pilot will be AR-trained. 3. One first and one second engineer (or higher) are required for a basic crew (minimum) 4. Two first engineers or higher are required for an augmented crew (minimum). 5. The designated primary loadmaster should be at least a C-5 Loadmaster journeyman on career status. 6. Two loadmasters required for all basic airlift missions (schedule three when resources are available) to include passenger loads up to 73 in the troop compartment. 7. One loadmaster required for all AR training missions with cargo or passengers on board. 8. When ten or less passengers are carried on local training missions, only one loadmaster is required. 		

3.2.3. NVG Aircrew Compliment. Normally, an NVG crew will consist of an NVG qualified crew member in each of the primary crew positions. However, the pilots may use NVGs even if the loadmaster(s) on the crew is not NVG qualified.

3.3. Aircrew Member Qualification. An aircrew member will be qualified or in qualification training to perform duties as a primary aircrew member.

3.3.1. Senior leaders who complete a Senior Staff Qualification course (restricted AF Form 8) or orientation for a Senior Staff Familiarization flight may occupy a primary crew position when under direct instructor supervision.

3.3.2. Crewmembers who complete the Senior Staff Course will log FP for Flight Authorization Duty Code on the AFTO IMT 781, **ARMS Aircrew/ Mission Flight Data Document**.

3.3.3. Crewmembers who complete a Senior Staff Familiarization flight will log OP for Flight Authorization Duty Code on the AFTO IMT 781, **ARMS Aircrew/ Mission Flight Data Document**.

3.3.4. AETC pilots in the AETC Instructor Enrichment Program may fly under the direct supervision of a qualified FTU instructor. No simulated emergencies will be performed.

3.4. Pilots. An instructor pilot (IP) must supervise non-current or unqualified pilots regaining currency or qualification (direct IP supervision during critical phases of flight).

3.4.1. SQ/CCs shall augment the PIC for missions over 16 hours Flight Duty Period (FDP) and designate those additional pilots authorized (if applicable) to perform PIC duties. The PIC shall brief the aircrew on the plan to transfer PIC duties (if applicable). (See [Table 3.1.](#))

3.4.2. Initial qualification pilots enrolled in a MAJCOM approved training course may accomplish tanker/receiver AR under IP supervision.

3.4.2.1. NVG Operations. Aircrew members will not conduct NVG operations for which they are not trained and certified. Units shall obtain MAJCOM/DO approval to perform any NVG maneuver or procedure not covered in this chapter or MAJCOM approved training syllabi.

3.4.3. Missions With Passengers. Only current and qualified pilots (possessing an AF IMT 8, **Certificate of Aircrew Qualification**) will occupy pilot seats with passengers on board.

3.4.3.1. A non-current but qualified pilot may regain currency with passengers on board if under direct IP supervision.

3.4.3.2. Pilots shall not fly touch-and-go landings with passengers. Touch-and-go and stop-and-go landings are authorized with Mission Essential Ground Personnel (MEGP) on board.

3.4.4. Pilots on duty familiarization flights will be monitored by another qualified pilot in the observer's seat.

3.5. Not Used.

3.6. Flight Engineers and Loadmasters. A non-current or unqualified flight engineer or loadmaster may serve as a primary aircrew member on any mission when supervised by a qualified instructor or flight examiner (direct supervision for critical phases of flight).

3.7. Aircrew Management. SQ/CCs and en route C2 agents shall ensure work/rest cycles permit an aircrew adequate time to safely accomplish mission duties and personal time for rest.

3.7.1. Flight Duty Period (FDP). FDP is the period of time starting at mission report time and ending immediately after the aircrew completes the final engine shutdown of the day. SQ/CCs shall form aircrews based on worst-case FDP in the mission directive. Reduce FDP when the autopilot pitch servo fails after departure IAW information below. If the autopilot fails after departure, consider mission requirements and determine the best course of action to preclude further mission delays due to reduced FDP. The best course of action may include diverting to an airfield with maintenance capability. Contact C2, coordinate intentions, and comply with limitations. **NOTE:** Failure of the autopilot pitch servo does not require a FDP reduction on the leg the failure is experienced.

3.7.1.1. Basic Crew FDP. The maximum FDP for a basic aircrew is 16 hours (12 hours when the autopilot pitch axis is inoperative or the pitch autopilot cannot be coupled to the FMS). All A/R and tactical events will be accomplished within the first 14 hours of the FDP. Once an aircrew begins a basic FDP, only MAJCOM/A3/DO may extend to augmented day regardless of aircrew composition (MAJCOM/A3/DO shall augment basic crew to extend FDP).

3.7.1.1.1. When extended en route ground times, non-optimum routing/winds, weather delays or other extenuating circumstances will increase a basic to an augmented FDP, a PIC with an augmented crew may accept an augmented FDP as long as:

3.7.1.1.1.1. The C2 agent or PIC discovers the extenuating circumstances before the first takeoff of the day.

3.7.1.1.1.2. The PIC verifies all augmenting aircrew members can get adequate rest en route.

3.7.1.1.2. A PIC with a basic crew may seek MAJCOM/A3/DO (mission execution authority) approval to extend the FDP as much as 2 hours to complete a scheduled mission. Only use this provision to recover from unscheduled/unplanned en route delays. C2 agents shall not ask PICs to exercise this option.

3.7.1.2. Augmented Crew FDP. Maximum FDP for an augmented aircrew is 24 hours (16 hours when the autopilot pitch axis is inoperative or the pitch autopilot cannot be coupled to the FMS). All A/R and tactical events will be accomplished within the first 18 hours of the FDP. SQ/CC need only augment the pilot portion of the aircrew when the autopilot is inoperative.

3.7.1.2.1. SQ/CC augment an aircrew when FDP exceeds 16 hours and the mission profile will allow augmenting aircrew members adequate time to rest en route. As a minimum, the mission profile must provide the following:

3.7.1.2.1.1. No more than 2 intermediate stops are authorized after 16 hours of FDP (each A/R shall count as an intermediate stop).

3.7.1.2.1.2. Mission profile shall include at least one 6 hour leg or two 4 hour legs.

3.7.1.2.1.3. The PIC shall validate planned leg times based on actual conditions, and the PIC may swap an extended ground time (4 hours) for a mission leg when conditions afford aircrew members a chance for rest.

3.7.1.3. Maximum FDP for nuclear airlift missions IAW AFI 11-299, *Nuclear Airlift Operations*.

3.7.1.4. Flight examiners administering evaluations will not exceed an augmented FDP.

3.7.1.5. Training FDP.

3.7.1.5.1. Maximum FDP for training, Joint Airborne/Air Transportability Training (JA/ATT), Functional Check Flight (FCF) and Acceptance Check Flight (ACFs) missions is 16 hours (12 hours when the autopilot is inoperative). Conduct the mission as follows:

3.7.1.5.2. Complete all mission-related events (i.e., FCF/ACF checks, transition events, A/R or tactical events) during the first 12 hours of the FDP.

3.7.1.5.2.1. ANG and AFRC crews may perform mission-related events on local training missions provided their time from start duty does not exceed 16 hours and actual flight duty does not exceed 12 hours.

3.7.1.5.2.1.1. Crew duty time (CDT) and FDP include both military duty and civilian work. CDT and FDP begin when an individual reports for their first duty period (military or civilian).

3.7.1.5.3. Crews may fly/deposition to home station or a deployed staging base following training (do not exceed 12 hours when the autopilot is inoperative).

3.7.2. Crew Duty Time (CDT). CDT is that period of time an aircrew may perform combined ground/flight duties. Plan the mission so aircrew members may complete post-mission duties within maximum CDT. An aircrew member may perform mission-related duties for other missions when approved by member's home station SQ/CC or equivalent. Maximum CDT is 18 hours for a basic aircrew and 24+45 hours for an augmented aircrew.

3.7.3. Except as outlined below, CDT/FDP begins 1 hour after aircrew alert notification. SQ/CC or equivalent may task aircrew members to perform other duties before they begin flight-related duties or MAJCOM/A3/DO may authorize a C2 agent to alert an aircrew member early: begin CDT/FDP when the first aircrew member reports for those duties.

3.7.3.1. For Self-alerts, the PIC shall coordinate early individual/crew mission report times with C2 agents. Begin CDT/FDP when the first aircrew member reports for duty.

3.7.3.2. For ALFA standby: begin CDT/FDP when C2 directs the aircrew to launch from crew rest or while performing a pre-flight (begin CDT/FDP when the aircrew arrived at the aircraft to begin the pre-flight).

3.7.3.3. For BRAVO standby: CDT/FDP begin when an aircrew member shows for duty, normally one hour after C2 alerts the aircrew from crew rest.

3.7.4. Deadhead Time. MAF aircrew members may deadhead for the purpose of positioning or de-positioning to perform a mobility mission or mission support function. Crewmembers may deadhead for a maximum of 24 hours. OG/CC or equivalent may approve crewmembers to deadhead in excess of 24 hours.

3.7.4.1. Current/qualified aircrew members may perform primary aircrew duties after flying in deadhead status provided they do not exceed a basic FDP (FDP starts at report time for deadhead flight).

3.7.4.2. Aircrew members may deadhead after performing primary crew duties, for a maximum of 24 hours from the time the crewmember's FDP began.

3.7.5. Aircrew Member Support of Aircraft Generation Activities (Pre-flight, cargo up-/off-load, start, and taxi aircraft). Crew rest is required IAW AFI 11-202V3, *General Flight Rules*. The duty day begins when the aircrew member reports for official duties. Maximum crew duty time is 12 hours.

3.8. Scheduling Restrictions. In accordance with paragraph 9.8. of AFI 11-202V3. In addition, SQ/CCs shall not schedule an aircrew member to fly nor will an aircrew member perform aircrew duties:

3.8.1. When the flight will exceed maximum flying time limitations of AFI 11-202V3.

3.8.2. Within 12 hours of consuming alcoholic beverages (based on scheduled takeoff or ALFA standby force legal for alert time, or earliest show time from BRAVO alert) or while under the influence of alcohol.

3.8.3. When using nasal sprays to treat symptoms of head congestion existing before flight. An aircrew member may use oxymetazoline or phenylephrine nasal sprays as get-me-downs following an unexpected ear or sinus block during flight.

3.9. Counter-Fatigue Management Program.

3.9.1. Aircrew may use medications with prior approval (on a voluntary basis following ground testing) that enhance natural rest during off-cycle crew rest periods. This section provides AMC/A3 guidance for the use of no-go pills (prescription medications) that help aircrew initiate and maintain restful sleep during off-cycle (desynchronization) crew rest periods. Fliers on augmented aircrews shall not use no-go pills in flight.

3.9.2. It is USAF policy that aircrew shall never use no-go pills as a first choice counter-fatigue management tool.

3.9.3. Responsibility for counter-fatigue management of aircrew medicinal products rests with the home station Flight Surgeon (FS), OG/CC (may delegate to but no lower than squadron commander), and with each individual aircrew member. During extended deployments, aircrew members will only obtain no-go pills from a deployed USAF flight surgeon. The deployed flight surgeon shall consult with the home unit medical team prior to dispensing no-go pills to deployed fliers.

3.9.4. Unit Operational Risk Management (ORM) programs shall include use of no-go medication with OG/CC and FS oversight. A basic counter-fatigue ORM model is available for mission planners, OG/CC, crew, and FS on the AMC/A3V website.

3.9.5. Home station or deployed FS trained using the AMC/SG-approved (lead command) counter fatigue program is the point of contact for no-go prescription. Upon request, the FS will advise/assist the local OG/CC to identify missions that may impair crew rest caused by duty day length, departure and arrival times, and other mission timelines.

3.9.6. Aircrew members on Personnel Reliability Program (PRP) status will follow PRP notification procedures if prescribed no-go Pills.

3.9.7. The OG/CC shall establish a system to inform the FS when missions fall into any of the following categories (may cause sleep disruptions and are therefore candidates for no-go medications):

3.9.7.1. Home station night launch missions greater than four hours duration.

3.9.7.2. Crew rest facilities lacking an optimal sleeping environment (quiet, cooled, and darkened).

3.9.7.3. Off-station missions that are 4 or more time zones from home station.

3.9.7.4. Rotating schedules (stair-stepped flying schedules) with greater than 6-hour flight time duration.

3.9.7.5. Missions that run consistently near a 14-hour (or greater) duty day.

3.9.8. SQ/CC will not schedule crewmembers to fly or perform crew duties within 12 hours of consuming no-go Pills (consider DNIF). **EXCEPTION:** Commanders may reduce the 12-hour timeline after consult with a flight surgeon to confirm prescribed no-go pills have short duration effect [6 hours for ambien (zolpidem) and 4 hours for sonata (zaleplon)]. In no case will crewmembers consume a no-go pill on a timeline where they would be under the effect of the medication while they perform aircrew duties (use mission report or legal for alert time to determine latest time to take no-go medication).

3.9.9. Aircrew member's responsibilities:

3.9.9.1. Aircrew members will complete ground testing for no-go pills and receive flight surgeon clearance prior to using no-go pills in the operational environment.

3.9.9.2. Aircrew members shall not operate equipment within 12-hours after consuming a no-go pill.

3.9.9.3. Aircrew members shall not take no-go-pills within 12-hours of consuming alcohol.

3.9.9.4. Aircrew members will inform the FS of any other medications (including nutritional supplements and over the counter medications) they are taking so the FS can evaluate potential interactions.

3.9.9.5. Limit use of restoril and ambien to a maximum of seven consecutive days and no more than 20 days in a 60-day period.

3.9.9.6. Limit use of sonata to a maximum of 10 consecutive days and no more than 28 days in a 60-day period.

3.10. Crew Rest/En route Ground Time. OG/CCs shall establish procedures to place crewmembers in crew rest. MAJCOM/A3/DO may waive any portion of the crew rest period or ground time as needed to meet mission tasking.

3.10.1. Home-Station Pre-Departure Crew Rest. For missions that will keep aircrew members off station 16 hours or more, unit commanders will enter primary and deadhead aircrew members into pre-departure crew rest 24 hours before the legal for alert time. Aircrew members may perform limited non-flying duties like mission planning during the first 12 hours of pre-departure crew rest. OG/CCs may waive any portion of the first 12 hours of pre-departure crew rest. Do not manifest deadhead aircrew members as passengers to deny pre-departure crew rest. **EXCEPTION:** AFRC, ANG, and AETC in accordance with AFI 11-202V3 and appropriate supplement.

3.10.2. Off-station/En route Crew Rest. The minimum en route crew rest period is 12 hours before legal for alert or scheduled report time when self-alerting.

3.10.2.1. Except during emergencies or as authorized by MAJCOM/A3/DO, C2 agents shall not disturb an aircrew member in crew rest. When necessary to interrupt aircrew members' crew rest period, re-enter that aircrew in a subsequent minimum 12 hour crew rest period after they complete official duties.

3.10.2.2. Do not enter aircrew members into crew rest until they complete official post-flight duties. Those duties may include, but are not limited to, refueling, cargo on-/off-load, aircrew arming, minor maintenance, or mission debriefing.

3.10.3. Off-station/En route Ground Time. Mobility planners shall provide aircrews at least 17 hours ground time between engine shutdown and subsequent takeoff.

3.10.3.1. Mission planners, PICs, or C2 agents may modify ground time as follows:

3.10.3.1.1. In the interest of safety.

3.10.3.1.2. To start (mission reporting time) no earlier than 12 hours from the time the aircrew entered crew rest. Before reducing ground time, PICs will consider time to complete mission planning, cargo on-/off-load, and non-standard mission related duties. C2 agents will not ask PICs to accept less than 17 hours ground time.

3.10.3.2. Mobility planners should construct mission itineraries with en route ground times longer than 17 hours to afford aircrew members opportunities to recover from the cumulative affects of fatigue caused by flying on several consecutive days or due to transiting several time zones. If practical, make the en route ground time 36 hours (maximum) after three consecutive near maximum FDPs.

3.10.4. Crew Enhancement Crew Rest (CECR). CECR is not an alternative to a safety-of-flight delay but provides aircrews a means to minimize the adverse effects of a crew alert and report period outside normal duty time. CECR periods should be of minimum duration and are normally used during de-positioning legs. Tasking authorities shall approve PIC requests to delay alert time to normalize the work-rest cycle or increase messing options when mission allows. When requests are disapproved, the C2 agent will inform the PIC of the reason for disapproval.

3.10.5. Post-Mission Crew Rest (PMCR). SQ/CCs shall give aircrew members returning to home base sufficient time to recover from cumulative effects of the mission and tend to personal needs. PMCR begins upon mission termination. (N/A AFRC, ANG, and AETC).

3.10.5.1. For missions that keep an aircrew off station 16 or more hours, the SQ/CC shall provide 1 hour (up to 96 hours) PMCR for each 3 hours off-station. Do not enter aircrew members in pre-departure crew rest until the PMCR period expires. Exception: AETC crewmembers on local training sorties that must remain off station overnight due to divers will not be afforded PMCR.

3.10.5.2. PMCR is not applicable to continuing missions and MAJCOM/A3/DO may suspend PMCR during contingency operations.

3.10.5.3. OG/CCs (or equivalents) are PMCR waiver authority.

3.10.6. Flying Crew Chief (FCC) Work/Rest Plan. While on Temporary Duty (TDY), the deployed FCC or MEGP maintenance technician shall report to the PIC. The PIC is the final authority on the FCC's work/rest schedule. The PIC shall ensure the FCC has sufficient time in each 24-hour period to get 8 hours of uninterrupted rest. See AFI 21-101, *Aerospace Equipment Maintenance Management*, for detailed guidance.

3.10.6.1. FCCs will not perform in flight duties/maintenance unless in the opinion of the PIC an emergency condition exists requiring FCC's assistance.

3.10.6.2. Upon arrival at en route locations the PIC will determine how long the FCC can safely perform aircraft maintenance duties on assigned aircraft. PIC will ensure the FCC has coordinated with en route maintenance supervision prior to entering crew rest with the crew.

3.10.6.3. During extended ground times (non-stage operations) the PIC should coordinate with en route maintenance supervision to determine FCC duty requirements for assigned aircraft.

3.10.7. The lead USAF component will publish MAJCOM/A3/DO-approved crew rest waivers in the Exercise or Contingency Operation Order (OPORD), Operation Plan (OPLAN), or Concept of Operations (CONOPS).

3.10.8. The Prime Knight program streamlines the process of getting aircrews from aircraft parking ramp into lodging/crew rest. It is only successful when billeting agents receive accurate aircrew/mission information in a timely manner.

3.10.8.1. C2 Agent Responsibilities. A MAJCOM C2 agent will forward information on the departing aircrew's orders to a point of contact (POC) for the next crew rest location's Prime Knight function.

3.10.8.2. PIC Responsibilities. If departing from a location with a C2 agency, ensure a C2 agent has accurate aircrew/mission information to forward to the next Prime Knight POC. If departing from a facility without a C2 agency, the PIC will call the next crew rest location Prime Knight POC to pass aircrew/mission information.

3.10.8.3. SQ/CC or designated authenticating official shall ensure TDY/Flight orders clearly indicate the unit fund cite so that the PIC may make Prime Knight reservations in advance. Without a unit fund cite on the TDY/Flight orders, the PIC must make advance reservations using a government travel card to participate in the Prime Knight program.

3.11. Alerting Procedures. MAJCOM C2 agents shall establish a legal for alert time with the PIC and when appropriate, the Medical Crew Director (MCD) of Aeromedical Evacuation (AE) crews. Whenever possible, C2 agents will inform PICs and MCDs of aircraft status, expected patient up load time, and other pertinent mission details that will streamline mission launch.

3.11.1. Aircrew alert time is normally 4+15 hours before scheduled takeoff time (allows 1 hour for reporting and 3+15 hours for mission preparation). Individual locations may increase or decrease this time depending on specific capabilities. OG/CCs may establish self-alert procedures for local training missions.

3.11.1.1. For missions with more than minimum ground time, the PIC may arrange an alert time providing additional preparation time to accomplish the mission. The PIC may also accept alerting with reduced preparation time when the mission allows. In all cases, the PIC shall coordinate changes to standard alerting times with the appropriate C2 agency.

3.11.1.2. With PIC agreement and when cargo load warrants (i.e. outsized and 1C-5A-9 Section 5 cargo), C2 agents may alert loadmasters up to 2 hours before normal alert time. When early alerting is warranted, the PIC and C2 agent must notify the loadmaster before he/she enters crew rest. Do not alert the loadmaster more than 1 hour before beginning cargo up load. Base the aircrew FDP on the loadmaster's show time.

3.11.1.3. C2 agents shall not alert an aircrew until the aircraft is in commission or there is reasonable assurance that maintenance technicians will complete repairs that allow the aircrew time to pre-flight and load the aircraft to meet the target takeoff time.

3.11.1.4. C2 agents shall not alert outbound crews when inbound aircraft is on A-2 or A-3 status until maintenance technicians determine required parts are available and the aircraft will be repaired within the target ground time.

3.11.1.5. Self-Alerts. Crews will self-alert at locations without a C2 agency, but must coordinate with controlling C2 agency. The PIC may elect to self-alert on operational missions at locations with a C2 agency. Coordinate the alert time with local C2 agents to avoid FDP limitations that result from unexpected changes in the mission.

3.11.2. The aircrew release policy is as follows:

3.11.2.1. On the aircrew's initial entry or re-entry into crew rest, the controlling C2 agent, or PIC during self-alerts, will establish an expected alert time.

3.11.2.2. For all missions, the latest allowable alert time is 6 hours after the expected alert time. The PIC may extend that window to 8 hours when flying as primary crew or 12 hours when flying in deadhead status. The controlling C2 agent will not ask the PIC to accept more than the 6 hour window. ANG/ AFRC aircrew members may extend the window as necessary to deadhead to home station to meet the Firm Scheduled Return Time (FSRT).

3.11.2.3. When a C2 agent determines circumstances will not allow for aircrew alerting during the legal for alert window, at that time but not earlier than the expected alert time, the C2 agent will contact the PIC and establish a new expected alert time at least 12 hours from the time of notification.

3.11.2.4. At the end of the legal for alert window or if the mission risk becomes elevated and the aircraft commander determines the overall risk of the mission prohibits safe continuation, he/she will contact a C2 agent and establish a new expected alert time.

3.12. Stage Management.

3.12.1. Stage Posture. Stages operate on a positive launch principle. C2 agents shall alert aircrews using the following priority/hierarchy:

3.12.1.1. Aircrews requiring an emergency return to home station.

3.12.1.2. Aircrews approaching their scheduled return time (SRT). Returning stage crews will be prioritized by their SRTs.

3.12.1.3. Aircrews in stage over 48 hours.

3.12.1.4. Aircrews in sequence of arrival time.

3.12.1.5. If the stage manager returns an aircrew in the stage to crew rest because of a mission delay or abort, that aircrew becomes first out when legal for alert.

3.12.2. Mechanical Stage. A C2 agent may create a mechanical stage when a delayed or aborted mission will not resume before that aircrew's FDP expires. Aircrews in a mechanical stage will be first out when a mission in the same direction transits their location while they are legal for alert. A C2 agent may bump an inbound aircrew with FDP to complete that mission to cycle aircrews in a mechanical stage. C2 agents should not normally establish a mechanical stage for ANG and AFRC crews flying unit-equipped aircraft.

3.13. Standby Force Duty. MAJCOM C2 Agents shall task units for Standby Force Duty not later than 18 hours prior to legal for alert time. This allows crewmembers 12 hours of pre-standby crew rest and 6 hours for aircraft pre-flight duty. When aircrews are unable to complete all preflight duties within 6 hours of crew show time, provide an additional 12-hour pre-standby crew rest. If MAJCOM C2 agents are unable to provide 18 hours prior notification, SQ/CC shall place the pre-standby crew in 12 hour crew rest and follow aircraft generation procedures in paragraph 3.7.5. to prepare the aircraft for launch. SQ/CC may keep an aircrew in ALFA/BRAVO status up to 48 hours. MAJCOM/A3/DO may extend this period for contingencies. After 48 hours, launch, release, or re-enter aircrew into 12 hour pre-departure crew rest. OG/CCs may provide additional local procedures for management of Standby Force Duties.

3.13.1. ALFA Standby Aircraft Preflight Generation and Security. When tasked, SQ/CC shall posture an aircraft and aircrew as an ALFA Standby Force able to launch within 1+30 hours. The following procedures apply to primary aircraft as well as spare aircraft generated for ALFA alerts. A mainte-

nance Dash -6 and aircrew Dash -1 preflight must be completed. Preflight validity will be in accordance with applicable T.O. After the preflight, the PIC will notify the controlling agency. The aircraft will remain in a sealed posture and be referred to as cocked on alert. Documentation of when the aircraft was cocked on alert must be placed in the forms. The PIC will ensure the aircraft is secure before entering crew rest. Secure all hatches and doors to show unauthorized entry. The aircrew preflight portion remains valid if performed by one crew, cocked on alert, and launched by another crew. Uncocking a generated aircraft is not a standard procedure but may be accomplished on a case-by-case basis. The PIC or a designated aircrew representative must be present if access to the aircraft is required. Ensure command and control and the controlling agency are notified when uncocking and recocking generated aircraft. Follow-on pre-flights done during normal waking hours do not interrupt crew rest. Begin CDT/FDP when C2 agent directs the aircrew to launch from crew rest or while performing pre-flight (begin CDT/FDP when the aircrew arrived at the aircraft to do the pre-flight).

3.13.2. BRAVO Standby Force. When tasked, SQ/CC shall posture an aircraft and/or aircrew in BRAVO Standby Force to permit launch within 3+30 hours. Follow-on pre-flights, if required, interrupt crew rest. Begin CDT/FDP when aircrew shows for duty.

3.13.3. CHARLIE Standby Force. When tasked, SQ/CC shall posture aircrews as a CHARLIE Standby Force ready to enter crew rest within 2 hours. Tasked aircrews will be legal for alert 12 hours after entering crew rest. SQ/CC may keep aircrews in CHARLIE status up to 72 hours. After 72 hours, release (for 12 hours before resuming CHARLIE Standby Force duty) or enter aircrew into 12 hours crew rest for directed mission, training mission, or ALFA or BRAVO Standby Force duty.

3.13.4. Wing Standby Force. OG/CC may place aircrews in Wing Standby status. After a 12 hour pre-departure crew rest period, aircrews are legal for alert for 12 hours and must be able to launch within 3+15 hours. After 12 hours, launch, release, or re-enter aircrews in 12 hour crew rest period before subsequent 12 hours Wing Standby duty.

3.13.5. Post-Standby Missions. On completion of standby duty, aircrew members may be dispatched on a mission. If started, post-standby crew rest must be completed before the start of pre-departure crew rest. If an aircrew member is dispatched on a mission, compute the post-mission crew rest time on standby time plus mission time.

3.13.6. Post Standby Crew Rest. Aircrew members not dispatched on a mission following standby duty will receive post-mission standby crew rest as follows:

3.13.6.1. If standby duty is performed away from normal quarters, crew rest time is computed from this standby time on the same basis as for mission time.

3.13.6.2. If standby duty was performed in normal quarters, no crew rest time is authorized.

3.13.7. DELTA Standby Force (JCS-directed alert force - applicable to 436 AW-only). Alert aircrew will be provided 12 hours crew rest prior to alert duty. Alert crew may be considered in crew rest on termination of a flight, even though remaining on alert. If a crew completes a real world mission within the alert cycle, they are legal for alert after 12 hours of crew rest. The length of a D-Alert tour will be determined by the unit commander, but it will not exceed 15 days.

3.13.7.1. D-alert crews will not be used as pre-flight crews for aircraft other than their designated aircraft to be used in case of launch.

3.13.7.2. D-alert crewmembers may complete ground currency events and limited office duties at their leisure while on alert; however, they will not accomplish those items that result in duty-not-including-flight (DNIF) status.

3.13.7.3. Flying on alert is authorized with the following restrictions:

3.13.7.3.1. At the discretion of the individual with a duty day of 8 hours.

3.13.7.3.2. Crewmembers fly for individual currency training. They are not in an instructor or examiner pool.

3.13.7.3.3. D-alert crew integrity is not required if recovery to Dover AFB or designated CONUS stage base can be accomplished within 3 hours of real world launch notification. If this cannot be met, D-alert crew integrity is required.

3.13.7.3.4. CDT for real world crisis response will begin when the crew shows for the real world mission.

3.14. Orientation Flights and Incentive Flights. Refer to DoD 4515.13-R, *Air Transportation*, AFI 11-401 and the appropriate MAJCOM supplement.

3.15. Interfly. Interfly is a temporary arrangement between OG/CCs or equivalent to permit the exchange or substitution of aircrew members and/or aircraft between mobility units to accomplish flying missions. Normally, interfly should be limited to specific operations, exercises, or special circumstances. However, it may be used for events of longer duration such as unit conversion to another model design series (MDS). Participating aircrews shall use guidelines established by the lead command or as specified in the OPLAN or CONOPS. **EXCEPTION:** AE crewmembers are exempt from interfly requirements. **NOTE:** ANG/XO has delegated approval authority to wing commanders for active duty/AFRC interfly with ANG. Conduct interfly operations as follows:

3.15.1. Aircrew members shall be current and qualified in the MDS (aircraft and model), as well as unique systems or configuration required to fly the aircraft/mission.

3.15.2. Aircrew members will follow operational procedures established by the lead command for the MDS. The Mission Commander or PIC will brief MAJCOM-specific items.

3.15.3. Each effected group commander who commits resources (personnel or aircraft) must concur with interfly proposal.

3.15.4. MDS conversion training.

3.15.4.1. Units may request an interfly agreement for duration of their conversion. OG/CCs will forward interfly requests to individual OG/CCs for approval. Requests will include as a minimum a list of effected units, duration of the agreement, and purpose.

3.16. Additional Crewmembers (ACM). Crewmembers qualified in mobility aircraft are authorized ACM status on any mobility aircraft to accomplish training, evaluation, or pre/de-position in support of mobility operations. MAJCOM designated crewmembers who are assigned or authorized to accompany the normal crew compliment are allowed ACM status.

3.16.1. Crewmembers in ACM status are not authorized to:

3.16.1.1. Displace manifested passengers.

3.16.1.2. Maintain currency and/or log flying time (except evaluators).

3.16.1.3. Use for transportation while on leave.

EXCEPTION: ANG/AFRC Air Technicians may be in a civilian leave status while traveling en route to perform in a military duty status.

3.16.1.4. Travel on Special Air Missions/Command Support Mission (SAM/CSM) aircraft unless authorized by HQ AF/CVAM through the PIC.

3.16.1.5. Travel on Special Assignment Airlift Missions (SAAM) when specifically restricted by the mission directive (Form 59).

3.16.1.6. Travel on Operational Support Airlift (OSA) aircraft unless authorized by Joint Operational Support Airlift Command (JOSAC) through the PIC.

3.16.2. All ACMs require valid travel/flight orders or supporting message authorizing ACM status. OG/CCs may authorize ACM status for their mobility aircrews.

3.16.3. Flight evaluators have priority and will not be displaced by any other ACM. The priority for evaluators is MAJCOM, NAF, group, and then squadron level.

3.16.4. ACMs normally travel in the crew compartment. If the number of ACMs desiring travel exceeds the capacity of the crew compartment, the C2 agency will notify the ATOC, who in turn will coordinate with the passenger terminal; seats not previously assigned may be used for ACMs.

3.16.5. The PIC, or designated representative, will brief ACMs on seat assignment, appropriate mission information, emergency procedures including egress, and armed crewmembers. The PIC may assign an ACM aircrew-related duties for which the ACM is qualified.

3.16.6. ACMs will coordinate their travel with the appropriate C2 agency prior to travel. They will process through the C2 agency as early as possible but NLT 3 hours prior to planned block time.

3.17. Mission Essential Ground Personnel (MEGP). Procedures and policies regarding MEGP are contained in AFI 11-401 and AMCI 11-208. PICs will ensure personnel traveling in this status are properly authorized.

3.18. Mission Mobility Observers (MMO). MAJCOM supplements or additional directives may establish programs authorizing senior military and civilian personnel to fly for mobility mission familiarization. For AMC MMO information reference AMCI 11-208.

Chapter 4

AIRCRAFT OPERATING RESTRICTIONS

4.1. Objective. Redundant systems may allow crews to safely perform some missions when a component/system is degraded. The Pilot in Command (PIC) is the final authority in determining the overall suitability of an aircraft for the mission. The PIC will ensure a detailed explanation of the discrepancy is entered in the AFTO Form 781A, **Maintenance Discrepancy and Work Document**; include the following maintenance identifiers to effectively communicate aircraft status:

- 4.1.1. Mission Essential (ME). The PIC will designate an item, system, or subsystem component essential for safe aircraft operation or mission completion as ME.
- 4.1.2. Mission Contributing (MC). The PIC will designate an item, system, or subsystem component, which is not currently essential for safe aircraft operation as MC. These discrepancies should be cleared at the earliest opportunity. If circumstances change or mission safety would be compromised, re-designate as ME. Do not delay a mission to clear a MC discrepancy.
- 4.1.3. Open Item (OI). The PIC will designate discrepancies not expected to adversely impact the current mission or any subsequent mission as an OI. These items are normally cleared at home station.

4.2. Minimum Equipment List (MEL) Policy. The MEL is a pre-launch document listing the minimum equipment/systems to operate the aircraft. It is impractical to prepare a list that anticipates all possible combinations of equipment malfunctions and contingent circumstances. Consider equipment/systems with no listed exceptions as grounding items. A PIC who accepted an aircraft with degraded equipment/systems is not committed to subsequent operations with the same degraded equipment. PICs are not committed to operations with degraded equipment accepted by another PIC.

- 4.2.1. The PIC shall account for the possibility of additional failures during continued operation with inoperative systems or components. The MEL is not intended for continued operation over an indefinite period with systems/subsystems inoperative.
- 4.2.2. All emergency equipment will be installed unless specifically exempted by mission requirements/directives.
- 4.2.3. Waiver Policy. A PIC prepared to operate with a degraded MEL item shall request a waiver through C2 channels. The PIC shall provide the C2 agent: 1) nature of request, 2) individual crew member qualification, 3) mission leg(s) requiring the waiver, and 4) the governing directive of waiver request to include volume, chapter, or paragraph. Initiate waiver requests as soon as possible; plan at least a 1-hour waiver process time.
- 4.2.4. PICs operating with waiver(s) for degraded equipment shall coordinate mission requirements (i.e., revised departure times, fuel requirements, maintenance requirements, etc.) with the controlling C2 agency and/or flight manager.
- 4.2.5. If beyond C2 communication capability, or when it is necessary to protect the crew or aircraft from a situation not covered by this chapter and immediate action is required, the PIC may deviate according to **paragraph 1.4**. Report deviations (without waiver) through channels to MAJCOM/A3/DO within 48-hours. OG/CCs shall collect background information and submit a follow-up written report upon request.

4.3. Waiver Protocol. Waivers to operate with degraded equipment are granted on a case-by-case basis. The PIC determines the need for a waiver after coordinating with the lowest practical level of command. MEL waiver authority is as follows:

4.3.1. Training Missions. OG/CC or equivalent with mission execution authority.

4.3.2. MAJCOM Directed Missions. MAJCOM/A3/DO with mission execution authority for active duty, AFRC, or ANG units flying MAJCOM-directed missions (includes Operational Readiness Inspections). Initiate the request with MAJCOM C2 agency. For AMC-directed missions contact HQ AMC/A3V through 618 TACC.

4.3.3. Contingency Missions. DIRMObFOR (or equivalent) for the agency with C2, if not specified in the OPORD/Tasking Order.

4.3.4. ANG or AFRC Directed Missions. ANG or AFRC maintains C2 and waiver authority for ANG or AFRC directed mission prior to mobilization.

4.3.5. Other Than MEL Waivers. Determine governing source document (i.e. AFI, Flight Manual, Maintenance TO, etc.) to ascertain the waiver authority. Use C2 channels to notify the appropriate waiver authority. Waivers of this nature may require an extended response time.

4.3.6. Engineering Dispositions (ED). Dispositions are requested when aircraft are damaged and/or established maintenance technical order procedures cannot be followed or do not exist. The on-site maintenance authority is responsible for requesting Engineering Dispositions. Most EDs allow maintenance to repair the aircraft and return it to unrestricted status; dispositions of this nature do not concern aircrews. However, EDs affecting aircrew operations require MEL waiver authority approval.

4.3.6.1. PICs shall coordinate dispositions containing flight restrictions, prohibitions, additional operating limits, or modified/nonstandard operating procedures with the appropriate MEL waiver authority (see **paragraph 4.3.**).

4.3.6.2. PICs will not accept dispositions appearing incomplete, in error, or unsafe. Prior to rejecting a disposition, the PIC will contact the appropriate MEL waiver authority. The waiver authority will attempt to resolve the issue.

NOTE: Deviations from the flight manual requires approval IAW the flight manual.

4.4. Technical Assistance. The PIC may request technical support and additional assistance from their home unit or MAJCOM C2 agency.

4.5. MEL Table Definitions/Column Identifiers. MEL tables are arranged by aircraft system to provide the PIC a mechanism to determine minimum system requirements. Requirements are defined by Home Station Departure/Main Operating Base (MOB) (Column A) and en route (Column B). Main operating bases are Travis AFB and Dover AFB. An asterisk (*) indicates number required is situation dependent; refer to Remarks/Limitations/Exceptions column for clarification. When transiting a MOB on pre-positioning and active legs use Column A. When transiting a MOB on a de-positioning leg use Column B. EXAMPLE: A Travis C-5 transiting Dover en route to Moron AB will use Column A. However, when transiting Dover en route to Travis (de-positioning) use Column B.

NOTES:

1. Column B requirements will not normally be waived when transiting a MOB on a de-positioning leg. Local training missions, to include off-station trainers fall under Column B.
2. A few en route locations possess the capability to provide C-5 maintenance repairs. These stations have necessary skilled maintenance personnel, support equipment, technical data, and parts on hand to accomplish some major and minor repairs. Common sense and good judgment must be used by all concerned when determining minimum equipment requirements to preclude adverse operational impact or excessive maintenance support requirements. In those instances where lack of replacement parts or qualified personnel would cause a mission delay, the en route location will be considered non-repair capable and aircraft may continue operations as described in the MEL.

4.5.1. Remarks/Limitations/Exceptions. Some technical information and procedures are contained in this column. This is not all-inclusive; crewmembers shall refer to the flight manual and other directives for procedures, techniques, limitations, etc.

4.5.1.1. One-time Flight Clarification: Normally a Red X discrepancy is downgraded for a one-time flight. This condition does not preclude carrying cargo and passengers. The priority is to move the airplane to a repair capable facility. PICs must coordinate with appropriate agencies to ensure repair capability exists at the destination. One-time flights may include en route stops only when necessary to recover the airplane. **Example:** An airplane departs on a gear-down flight from Kuwait and requires an en route fuel stop (Sigonella NAS) before landing at the nearest repair capable facility, Rota NAS.

4.5.1.1.1. One-time flight to nearest repair capable facility: Flight is limited to the nearest (shortest en route time) repair capable base. **NOTE:** May not depart home station for a local training sortie, i.e. the aircraft is already at a repair capable base.

4.5.1.1.2. One-time flight to a repair capable facility: Flight is not restricted to the nearest repair capable facility.

4.5.1.2. Other Mission and Repair Clarifications:

4.5.1.2.1. Shall be repaired at next repair capable facility: Mission may continue as scheduled, item shall be repaired upon reaching a repair capable facility. Designate item ME upon reaching repair facility. Once maintenance action is initiated, and it is determined repairs are not possible, the PIC will discuss possible courses of action with C2 agency to return aircraft to service.

4.5.1.2.2. Mission dictates requirement: PIC shall consider the entire mission profile, not just the next leg. **Example:** An airplane is departing an en route station with repair capability, after engine start the FE discovers the #1 engine anti-ice is inoperative. Icing conditions are not forecasted for the next leg. However, because the mission spans several days and repair capability does not exist at the scheduled en route stops, the PIC elects to have the item repaired prior to departing.

4.6. C-5 MEL. This MEL applies to all C-5 models and lists the minimum equipment and systems to launch the aircraft under routine operations. The MEL does not include all equipment or systems essential to airworthiness. The MEL is not intended to promote continued operation of the aircraft for an indefinite period with systems/subsystems inoperative. See this chapter for further information including objectives, policy, and waiver protocol.

Table 4.1. Engines/Auxiliary Power Units (APU).

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
1-1. Engine Fuel Pump	4	4	3	Both affected fuel tank boost pumps shall be operative. One-time flight to nearest repair capable facility if only low-pressure element is inoperative.
a. Fuel shutoff actuator	4	4	4	
1-2. Continuous Ignition	4	4	3	Requires MAJCOM approval. One-time flight to nearest repair capable facility. Normal and Airstart position shall be operative
1-3. Start Ignition	4	4	4	Either Normal or Airstart position shall be operative.
1-4. Starter	4	4	4	
1-5. Fuel Heater	4	4	3	Required on flights with fuel temperature below 0° C. Valve must be failed closed.
1-6. Oil Pressure Indicating System				
a. Low Oil Pressure Switch	4	4	3	The low oil pressure light may be inoperative if the oil pressure gauge is operative.
b. Oil Pressure Gauge	4	4	4	
1-7. Oil Temperature Indicator	4	4	4	
1-8. Oil Filter Differential Pressure Light	4	4	3	Mission may continue if malfunction is determined to be an indication problem and the oil filter has been checked for clogging or indication of bearing failure (metal chips). The engine oil filter shall be checked at every stop until the indication malfunction is corrected. Carry spare seals.
1-9. N1 Indicator	8	8	*	If possible, place the operative indicator at the engineer panel. Associated N2 shall be operative. (B) Both may be inoperative, at least one shall be repaired at next repair capable facility.
1-10. N2 Indicator	8	8	1/Eng	If possible, place the operative indicator at the engineer panel. Associated N1 shall be operative.
1-11. TIT Indicator	8	8	1/Eng	If possible, place the operative indicator at the engineer panel.
1-12. Fuel Flow Indicator	8	8	1/Eng	If possible, place the operative indicator at the engineer panel.
1-13. Engine Overheat & Fire Detection System	4	4	4	System shall be capable of detecting both an engine fire and overheat condition. 1. Do not take-off with a shorted system. 2. Fire warning and overheat test shall be operative. (B) Open circuits. Take-off from a non-repair capable facility only. Shall be repaired at next repair capable facility. No more than one open circuit may exist and the location of the break shall be determined. Re-verify open at each en route stop.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
a. Engine Fire Annunciator/Warning Light	8	8	*	(B) One light shall function at the pilot or engineer position. The associated fire handle light shall be operative. Shall be repaired at next repair capable facility.
b. Engine Overheat Annunciator/Warning Light	8	8	*	(B) One light shall function at the pilot or engineer position. The associated fire handle light shall be operative. Shall be repaired at next repair capable facility.
c. Engine/Pylon Optical Fire Detection System	4	4	*	(B) Fire, overheat, and short discriminator tests shall be operative. Shall be repaired at next repair capable facility.
1-14. Engine Fire Extinguishing System				
a. Engine Fire Handle	4	4	4	(B) Handles shall be fully capable of automatic isolation of system components as outlined in T.O. 1C-5A-1. If the light in the handle is inoperative, the associated annunciator light shall operate at both pilot and flight engineer positions.
b. Bottle Out Light	4	4	3	En route with no maintenance, if cockpit indicator is inop, check the pressure gauge on the bottle prior to each flight. Mission may continue via en route stops with proper maintenance stands; repair as soon as practical.
c. Fire Extinguisher Bottle	4	4	4	(B) A squib assembly can be obtained from either APU fire bottle. Remove the squib designated alternate. See item 1-23
d. Fire Extinguisher Discharge Button	4	4	4	Shall be capable of firing bottles.
e. Fire Extinguisher Bottle Select Switch	2	2	2	Both Normal and Alternate positions shall be fully operable.
1-15. Thrust Reverser	4	4	2	(B) May only be deactivated in symmetrical pairs IAW T.O. 1C-5A-2-4. Verify all actuators are attached to the translating cowl and that all locks are locked prior to deactivation. No thrust reverser may be deactivated if any hydraulic actuator leaks beyond limits. Outboard T/Rs--repair as soon as practical. Inboard T/Rs--shall be repaired at next repair capable facility. Deactivation of inboard T/Rs require restricted flight to FL 250.
a. THRUST REV PRESSURE light	4	4	2	(B) Thrust Reversers shall be deactivated. See Table 4.1. Item 1-15.
b. TH REV N LKD light	4	4	4	
c. TH REV EXTD light	4	4	2	(B) T/Rs shall be deactivated. See Table 4.1. Item 1-15.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
1-16. Engine Cowl Blowout Door	8	8	8	
1-17. Engine Anti-Ice	4	4	*	Engine and nacelle anti-ice required for flights into forecasted icing conditions.
1-18. APU	2	2	1	Refer to T.O. 1C-5A-1, Section 2, for operation with single APU operation. APU CONTROL circuit breaker shall remain closed.
1-19. APU Bleed Valve	2	2	1	Required for each operative APU.
1-20. APU Isolation Valve	2	1	1	If one APU Isolation valve is inoperative, both APUs shall be capable of providing bleed air. If valve is failed closed to the respective APU, the APU bleed valve shall be operative to supply bleed air for the ATM and the other APU shall be capable of supplying bleed air and electrical power IAW T.O. 1C-5A-1, Section 2. If the valve is failed open, the respective APU bleed valve shall be operative.
1-21. APU Isolation Valve Open Light	2	1	0	Valve operation shall be confirmed prior to every departure.
1-22. APU Fire Warning System	2	2	1	For ground operations, do not operate affected APU and associated ATM unless a fire guard is present.
1-23. APU Fire Bottle	2	2	1	For ground operations, do not operate affected APU and associated ATM unless a fire guard is present.
1-24. APU Exhaust Gas Temperature (EGT) Indicator	2	2	1	Shall be operative on any APU that is planned to be operated. Off flag may be in view as long as indicator functions.
1-25. APU Door Open Light	2	2	0	Confirm door is closed before departure.
1-26. APU Start Light	2	2	1	Starting will be closely monitored by the scanner.
1-27. APU On Speed Light	2	2	0	Verify on speed by checking APU generator frequency.

Table 4.2. Bleed Air, Environmental, Etc. Systems.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
2-1. Air Conditioning Pack	2	2	1	One pack may be inoperative if floor heat is operative and aircraft is capable of maintaining pressurization. Due to increased structural fatigue, if both packs are inoperative, aircraft is limited to one-time unpressurized flight below 10,000' MSL with MAJCOM approval.
2-2. Air Conditioning Master Switch	1	1	1	Shall have control of air conditioning packs.
2-3. Air Conditioning Overheat Light	2	2	1	Required for each operating pack.
2-4. Air Conditioning Overheat Sensor	2	2	1	Required for each operating pack.
2-5. Airflow Selector Switch	1	1	0	May be electrically inoperative provided valves can be manually positioned.
2-6. Compartment Temperature Indicator	3	0	0	Unmanned compartments shall be monitored for proper temperature. Close troop comp shutoff valve if unoccupied. (A) If indicator is inoperative, Auto mode must function.
2-7. Flight Station Temp Control	1	*	*	Auto mode may be inoperative provided temp control valve can be positioned manually or with control switch in manual.
2-8. Relief Compartment Temp Control	1	*	*	Auto mode may be inoperative provided temp control valve can be positioned manually or with control switch in manual.
2-9. Cargo Compartment Temp Control	1	*	*	Auto mode may be inoperative provided temp control valve can be positioned manually or with control switch in manual.
2-10. Troop Compartment Temp Control	1	*	*	Auto mode may be inoperative provided temp control valve can be positioned manually or with control switch in manual. If compartment is unoccupied, valve will be closed.
2-11. Troop Compartment Shutoff Valve	1	1	*	May be electrically inoperative, provided control valve can be positioned manually.
2-12. Cooling Air Exit Door	2	2	1	Door shall be installed. If the door is stuck closed, do not operate the affected A/C below .3 Mach, with slats extended or when the aircraft is on the ground. If the door is stuck open, do not flight plan above FL 280 to prevent A/C pack freezing.
2-13. Cooling Air Exit Valve	2	2	1	Required for operating air conditioner.
2-14. Cooling Fan	2	2	1	If fan is inoperative, do not operate the affected system on the ground, or with slats extended, or below .3 Mach.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
2-15. Cooling Fan Control Valve	2	2	1	If valve failed closed, do not operate the affected system on the ground, or with slats extended, or below .3 Mach.
2-16. Primary Heat Exchanger High Limit Sensor	2	2	1	Required for operating pack.
2-17. Primary Heat Exchanger Temp Control Sensor	2	2	1	Required for operating pack.
2-18. Flow Control and Shut-off Valve	2	2	1	Required for each operating pack
2-19. Low Limit Temperature Control Sensor	2	2	0	May be electrically inoperative if manual control is available. If one sensor or control box is inoperative, install the bad component in the right-hand system.
2-20. Low Limit Temperature Control Valve	2	2	0	May be inoperative if manual control is available. If possible, change components to make left system operative; i.e., swap sensor, control box, etc. with right system.
2-21. Diverter Valve	1	1	0	May be electrically inoperative provided it can be manually positioned.
2-22. Alternate Air Valve	1	1	0	May be electrically inoperative provided it can be manually positioned.
2-23. Aux Vent Valve	1	1	1	(B) May be electrically inoperative provided it can be manually positioned. One-time flight to repair capable facility.
2-24. Bleed Duct Ovht Sys	3	3	3	
2-25. Bleed Air Shutoff Valve	4	4	4	
2-26. Bleed Air Shutoff Valve Indicator Light	4	4	2	One may be inoperative per wing, provided valve can be checked for proper operation during bleed down check. To verify operation with APU supplying pressure, turn on engine anti-ice with pylon bleed air shutoff valve in the open position and look for a pressure drop, then close valve while looking for pressure increase.
2-27. Pressurization System				NOTE: Unless directed by other chapters of this instruction, the aircraft should not be flown unpressurized. If inoperative, MAJCOM approval for one-time flight to repair capable facility, not to exceed 10,000' cabin altitude.
2-28. Automatic Pressure Controller	1	0	0	May be inoperative provided manual mode is fully operative. If the manual controller fails in-flight, use AC Master Switch, floor heat, and engine bleed valves to control pressurization.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
2-29. Manual Pressure Controller	1	1	0	Shall be operative for pressurized flight. If inoperative, MAJCOM approval for one-time flight to repair capable facility, not to exceed 10,000' cabin altitude. Outflow and Thrust Recovery valves must be open.
2-30. Outflow Valve Indicator	1	1	0	Cabin rate of climb and differential pressure indicator shall be operative. Use the scanner to complete preflight steps.
2-31. Outflow Valve Thrust Recovery Valve	1 ea	2	0	Both shall be operative for pressurized flight. Outflow and Thrust Recovery valve(s) may be failed (open only); MAJCOM approval required for one-time flight to repair capable facility, not to exceed 10,000' cabin altitude.
2-32. Cabin Altimeter and Differential Pressure Indicator	1	1	0	Shall be operative for pressurized flight. MAJCOM approval for one-time flight to repair capable facility, not to exceed 10,000' MSL. Cabin Press Low Light shall be operative.
2-33. Cabin Press Low Light	1	1	0	Cabin Altimeter/Differential Pressure indicator shall function for flights above 10,000' MSL.
2-34. Cabin Rate of Climb Indicator	1	1	0	Automatic pressurization controller, cabin altimeter and differential pressure indicator, and Cabin Press Low Light shall be operative. If any component listed above is inoperative, one-time unpressurized flight to repair capable facility permitted, not to exceed 10,000' MSL.
2-35. Emergency Depress System	1	1	0	Shall be operative for pressurized flight. MAJCOM approval for one-time flight to repair capable facility, not to exceed 10,000' MSL. Cabin Press Low Light shall be operative.
2-36. Floor Heat System	1	1	0	If only one AC pack is operating, the floor heat system is required to maintain cabin altitude below 10,000'. If inoperative, both AC packs shall be operative to maintain cabin altitude below 10,000'. One system (Fwd or Aft) may be inoperative if both packs are operable. Exception: N/A for pattern locals. Shall be operative if cargo requires temperature-controlled environment.
2-37. Floor Heat Duct Anticipator	2	2	0	The affected floor heat valve(s) will cycle. Not recommended when using manual pressurization. N/A when floor heat is not used.
2-38. Manifold Bleed Air Pressure Indicator	1	1	1	
2-39. Pressure Aug Valve	4	4	2	(B) May be failed closed.
2-40. Pressurization Mode Selector Switch	1	1	0	Manual mode must be operative for pressurized flight. If inoperative, Outflow and Thrust Recovery valves must be open. MAJCOM approval for one-time flight to repair capable facility, not to exceed 10,000' MSL.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
2-41. Start Valve Open Light	4	4	4	
2-42. Temp Aug Valve	4	4	*	(B) May be inoperative (failed closed) for operation in non-icing conditions.
2-43. Wheel Well Isolation Valve	1	0	0	Shall be able to manually close the valve.
2-44. Wing Isolation Valve	2	2	1	Shall be able to manually close the valve.
2-45. Safety Valve	2	2	0	Both shall be operative for pressurized flight. If inop, Thrust Recovery and Outflow valves must be fully open. MAJCOM approval required for one-time flight to repair capable facility, not to exceed 10,000' MSL
2-46. Pitot Heat System (2 Mast and 2 Head Heat for each position)	2	2	1	Both Mast and Head heat required for flights in RVSM airspace. One Mast and/or Head heat system for each position may be inoperative for flights conducted in non-icing conditions in non-RVSM airspace.
2-47. AoA De-ice System	2	1	1	One system shall be fully operative. Associated stallimiter must also be operative.
2-48. Windshield Heat	5	3	2	Side vision window heat may be inoperative. (A) The 3 front windshield panels shall function. (B) Must have windshield heat for at least 2 of the 3 front windshield panels.
2-49. Windshield Wiper	2	2	*	One system shall be operative for flights into forecast precipitation at arrival or departure.
2-50. Total Temp Probe	2	2	2	
2-51. Total Air Temperature (TAT) Indicator	1	0	0	Use FMS total temp information.

Table 4.3. Hydraulics.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
3-1. 1-2 PTU	1	1	0	(B) May be inoperative provided #1 ATM and #1 & #2 engine-driven pumps (all) are operative.
3-2. 2-3 PTU	1	1	0	(B) May be inoperative provided the 1-2 and 3-4 PTUs, and #2 and #3 engine-driven pumps (all) are operative.
3-3. 3-4 PTU	1	1	0	(B) May be inoperative provided #4 ATM and #3 & #4 engine-driven pumps (all) are operative.
3-4. ATM ON Light	2	2	1	(B) May be inoperative if ATM is made inoperative. Hydraulics must be isolated.
3-5. ATM	2	2	1	(B) Applicable PTU and engine-driven pumps shall be operative. Complete required preflight items after engine start. Caution: Do not perform anti-skid check w/engines running.
3-6. Electric Suction Boost Pump	2	2	*	(B) Associated hydraulic suction boost pump shall be operative. If the filter button is popped, system filters must be checked for contamination. If both pumps are inop, one-time flight to nearest repair capable facility.
3-7. Engine-Driven Hydraulic Pump	8	8	6	All pumps shall have positive depress capability. (B) Check pump for sheared shaft and associated system filters for contamination. Adjacent PTUs shall be operative. Only one pump on two nonadjacent engines may be inoperative.
3-8. Flight Engineer Hydraulic Pressure Gauge	4	4	*	Direct reading gauge shall be operative and periodically monitored. (B) Two gauges may be inoperative for one-time flight to repair capable facility. Associated PRESS LOW lights shall be operative.
3-9. Flight Engineer Hydraulic Quantity Indicator	4	4	3	(B) Sight gauge shall be monitored periodically.
3-10. Hydraulic Boost Press Low Light	4	4	*	Monitor associated system(s). (B) Mission may continue with one light inoperative; repair at next repair capable facility. Two lights may be inoperative for a one-time flight to a repair capable facility.
3-11. Hydraulic Pressure Gauge (Direct Reading)	4	4	3	Flight engineer hydraulic pressure gauge shall be operative.
3-12. Hydraulic Pump Press Low Light	8	8	6	Associated flight engineer hydraulic pressure gauge shall be operative. Depress unaffected hydraulic pump. No more than one light on each non-adjacent engine may be inoperative
3-13. Hydraulic Reservoir Sight Gauge	4	4	0	May be capped if flight engineer hydraulic quantity indicator is operative. Verify hydraulic quantity prior to launch.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
3-14. Hydraulic Suction Boost Pump	4	4	2	#1 and #4 may be inoperative if the respective electrical suction boost pump is operative. Check hydraulic filter buttons for contamination indications. If #2 or #3 boost pump fails, swapping the failed boost pump with either #1 or #4 is permissible provided no contamination is present.
3-15. RAT	1	1	1	
3-16. RAT Deploy Light	1	1	0	(B) May be inoperative, monitor RAT unlocked light to indicate RAT is deployed.
3-17. RAT Unlocked Light	1	1	1	

Table 4.4. Landing Gear. (Refer to paragraph 4.7.)

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
4-1. Anti-Skid System				Operation with less than all anti-skid components operative is an emergency procedure and shall be IAW T.O. 1C-5A-1.
a. Anti-Skid Off Light	1	1	1	(B) MAJCOM approval required for one-time flight to repair capable facility.
b. Brakes Light	1	1	0	(B) Determine status of brakes prior to takeoff. One-time flight to repair capable facility.
c. No Brakes Light	1	1	1	(B) MAJCOM approval required for one-time flight to repair capable facility.
d. DET Fail Light	1	1	1	(B) MAJCOM approval required for one-time flight to repair capable facility.
4-2. Normal Brake System	1	1	1	
a. Normal Brake Pressure Indicator	1	1	0	(B) Shall be repaired at next repair capable facility. EMER HYD brake pressure light shall be operative. Alternate brake pressure indicator and flight engineer's #4 pressure gauge shall be operative. Select alternate brakes for landing. If normal brakes are required for landing, perform a Brake System Check (In-flight).
4-3. Alternate Brake System	1	1	1	
a. Alternate Brake Pressure Indicator	1	1	0	Shall be repaired at next repair capable facility. Normal brake pressure indicator and flight engineer's #1 pressure gauge shall be operative. Select normal brakes for landing. If alternate brakes are required for landing, perform a Brake System Check (In-flight).
4-4. Emergency Brake System	1	1	1	
a. EMER HYD Brake Pressure Light	1	1	0	Shall be repaired at next repair capable facility. Normal brake pressure indicator shall be operative.
4-5. Parking Brake	1	1	0	(B) If inoperative, brakes shall be guarded at all times when chocks are removed. Scanner shall install chocks in the event of an emergency. One-time flight to repair capable facility. Local missions--may be flown at the discretion of the instructor pilot. Do not accomplish kneeling/loading/ unloading with engines running. With engines shutdown, brakes shall be guarded if operation requires parking brake set.
4-6. MLG Caster System	1	1	0	Mission dictates requirement.
a. MLG Free Lights	2	2	*	Copilot shall monitor position indicators. If lights are inoperative, do not accomplish kneeling operations.
b. Aft MLG Position and Emergency Control Switch	2	2	*	Limit caster operations. Shall be repaired at next repair capable facility. Mission segments limited to tow-capable locations. Normal caster shall be operative.
4-7. Emergency Extend Switch	5	5	0	One-time flight with affected gear down to nearest repair capable facility.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
4-8. Kneeling System	1	1	0	All main landing gear shall be capable of in-flight kneeling. If not capable, one-time flight with the affected MLG gear down to nearest repair capable facility.
4-9. Landing Gear Warning System				
a. Landing Gear Warning Horn	1	1	0	Shall be repaired at next repair capable facility.
b. Landing Gear Warning Light	2	2	*	(B) One light may be inoperative. If both lights are inoperative, one-time flight to a repair capable facility. All gear position indicators shall be operative.
c. Landing Gear Warning Test Button	1	1	0	Shall be repaired at next repair capable facility.
d. Horn Silence Button	1	1	0	Shall be repaired at next repair capable facility.
e. Emergency Switch On Light	1	1	0	One-time flight w/all gear down to nearest repair capable facility.
f. Bogie Pitch Annunciator Light	4	4	0	One-time flight with affected gear down to nearest repair capable facility.
4-10. NLG Fiber Optics Scope	1	1	0	One-time flight with NLG down to nearest repair capable facility.
4-11. NLG Inspection Light	3	1	0	Light for the fiber optics target required day or night. One-time flight with NLG down to nearest repair capable facility.
4-12. MLG Inspection Light	2/ gear	1/ gear	*	One per MLG should be operative for night operations. If both lights are inoperative, attempt to use a light from a wheel well with two operative lights.
4-13. Nose Gear Steering	1	1	1	Both Normal and Emergency Systems shall be operative.
a. Rudder Pedal Steering	1	1	0	Nose Gear Steering System (wheel) shall be operative. Shall be repaired at next repair capable facility.
4-14. Position and Indicating Systems	1	1	0	One-time flight with affected gear down to nearest repair capable facility. Prior to landing, affected gear will be visually verified for proper down and locked indications at sequence control panel and inspection covers/fiber optics.
4-15. Relay Logic System	3	3	*	One-time flight with affected gear down to nearest repair capable facility. Prior to landing, affected gear will be visually verified for proper down and locked indications. With MAJCOM approval, mission may continue using Alternate MLG Retraction Procedures (Standard Configuration).
4-16. Crew Entrance Door Accumulator	1	1	1	
4-17. APU Accumulator (Left/ Right)	2	2	0	If inoperative, one-time flight with affected gear (2) down to nearest repair capable facility.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
4-18 MLG Secondary Strut (deflated)	4	4	3	One-time flight to nearest repair capable facility. Refer to T.O. 1C-5A-1, Section 5, Weight Limitations chart, delta note 1.

4.7. Gear down flight. Gear down flight operations will be limited to those sorties required to move the aircraft to the nearest repair capable facility. Gear down flight should only be considered after reasonable efforts to repair the aircraft have been attempted. AMC/A3V waiver approval is not required provided the airplane is being flown to the nearest repair capable facility. If the airplane is on a red X for a gear malfunction the airplane home station MXG/CC must downgrade the red X per T.O. 00-20-1 prior to flight.

4.7.1. Local Training Missions. Local missions will not be planned gear down. When in-flight malfunctions prohibit gear retraction (except MLG rotational malfunctions), the local may continue after the cause of malfunction has been identified and the AC and maintenance supervisor concur. Do not exceed 200 KCAS/M.60.

4.7.2. Gear Down Flight Procedures.

4.7.2.1. Plan to not exceed 200 KCAS/M.60 to help prevent APU servicing door and gear door damage. When range is a factor, fly an airspeed that yields the maximum range; do not exceed 250 KCAS/M.60. **Exception:** Tactical departures will not exceed 250 KCAS.

4.7.2.2. For planned gear down flight, the affected gear shall be pinned. The APU servicing door panel will be speed taped upon completion of the 1C-5A-1 inspection and prior to flight. Taping may help prevent loss of the door panel. Only the door panel on the appropriate side requires speed tape.

4.7.2.3. After each gear down flight, make an AFTO Form 781A entry requiring a visual inspection prior to the next flight. The MLG inspection will include affected gear-well area, LN2 servicing panel (if applicable), and doors. NLG inspection will include gear-well area, doors, folding bulkhead door, actuators, and brackets. This inspection may be accomplished by the flight engineer.

Table 4.5. Flight Controls. (Refer to paragraph 4.8.)

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
5-1. AILERONS				
a. Aileron Actuator/per wing	2	2	2	
b. Aileron Trim Actuator	2	2	1	(B) Mission may continue with one actuator inoperative. Shall be repaired at next repair capable facility. Aileron shall be centered prior to flight.
c. Aileron Trim Position Indicator	1	1	0	Required for touch-and-go operations. Ailerons shall be centered prior to flight.
d. Aileron Artificial Feel	1	1	0	One-time flight to repair capable facility.
e. PACS Roll System	1	1	0	Shall be repaired at next repair capable facility.
5-2. ALDCS	1	1	*	Shall be repaired at next repair capable facility. When scheduled for air refueling, every effort should be made to launch with an operative ALDCS.
5-3. Autopilot	1	1	*	Mission dictates requirement. Pitch autopilot required for flights through RVSM airspace.
5-4. ELEVATORS				
a. Inboard Elevator Actuator	2	2	2	
b. Outboard Elevator Actuator	3	3	3	
c. Elevator Artificial Feel System (VFUs)	2	2	*	(B) One assembly (system 1 or 4) may be inoperative for local missions. If both are inoperative, one-time flight to nearest repair capable facility. Do not engage pitch autopilot. If test equipment is not available, do not drain VFU bottles (Ref T.O. 1C-5A-2-6)
d. PACS Pitch System	1	1	0	Shall be repaired at next repair capable facility.
5-5. Flap Slat Asymmetry System	1	1	1	
5-6. Flap Position Indicator	1	1	0	One-time flight to repair capable facility. Slat indicator shall be operative. Scan flaps to verify approximate position.
5-7. Flight Augmentation Systems (Lat, Yaw, Pitch)	1 ea.	1 ea	0	Refer to flight manual. May fly with lateral, yaw, or pitch faults. For inoperative yaw augmentation axis, one-time flight to repair capable facility. Applicable autopilot axis will be inoperative.
5-8. Flight Spoilers	10	10	10	
5-9. Ground Spoilers	8	8	8	
5-10. Horizontal Stabilizer Pitch Trim				
a. Normal Pitch Trim	1	1	0	One-time flight to nearest repair capable facility. Alternate and manual trim shall be operative.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
b. Alternate Pitch Trim	1	1	0	One-time flight to nearest repair capable facility. Normal and manual trim shall be operative.
c. Manual Pitch Trim	1	1	1	
d. Trim Disconnect Switch	2	2	1	Seat with operative switch shall be occupied at all times. One-time flight to repair capable facility.
e. Horizontal Stabilizer Trim Position Indicator	1	1	1	
5-11. Ratio Shifters	2	2	0	Select matching position. Flaps down position should be operative.
5-12. Flight Control Hydraulic System Off Light/Pressure Switch	54	54	*	Check the affected system for proper operation prior to flight. Flight spoilers--one light per system per side may be inoperative or malfunctioning. Other flight controls--one light may be inoperative or malfunctioning per flight control. MAJCOM approval required (for a one-time flight to repair capable facility) when more than one light/switch per flight control is inoperative or malfunctioning.
5-13. Flight Hydraulic Power Shutoff Valve	54	54	*	One inop per flight control; verify valve is open prior to takeoff. Shall be repaired at next repair capable facility.
5-14. RUDDERS				
a. Rudder Actuator	4	4	4	
b. Rudder Limiter	1	1	0	Select MIN Q to assure full rudder travel is available. Shall be repaired at next repair capable facility.
c. Rudder Trim	1	1	0	Shall be repaired at next repair capable facility. Yaw Aug Man Trim shall be operative
d. Rudder Trim Position Indicator	1	1	0	Required for touch-and-go operations. One turn-and-slip indicator shall be fully operative; visually center the rudder prior to flight. Line missions -- repair as soon as practical.
e. Emergency Rudder (Yaw Aug Man Trim)	1	1	0	One-time flight to repair capable facility.
5-15. Slat Position Indicator	1	1	0	One-time flight to repair capable facility. Flap indicator shall be operative. Visually scan to verify approximate slat position.
5-16. Slat Drive Disconnect Switch	1	1	0	One-time flight to repair capable facility. Takeoff and Landing will be conducted with slats retracted.
5-17. Operational Slats	1	1	*	(A) Slat systems shall be fully operational. (B) See Paragraph 4.8.

4.8. SLATS INOPERATIVE Slats retracted flight operations will be limited to those sorties required to move the aircraft to the nearest repair capable facility. Slats retracted flight should only be considered after reasonable efforts to repair the aircraft have been attempted. AMC/A3V waiver approval is not

required provided the airplane is being flown (slats retracted with flap system operational) to the nearest repair capable facility. If the airplane is on a red X for a slat malfunction the airplane home station MXG/CC must downgrade the red X per T.O. 00-20-1 prior to flight.

4.8.1. Slats extended flight operations: Refer to T.O. 1C-5A-1, Section 5, LIMITATIONS FOR CRUISE OPERATIONS WITH FLAPS UP – SLATS EXTENDED.

Table 4.6 Fuel Systems. (Refer to Paragraph 4.9.)

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
6-1. Aerial Refuel System.	1	*	*	Mission dictates requirement.
6-2. Aerial Refuel Slipway Light	2	*	*	Mission dictates requirement. At least one light required for night air refueling.
6-3. Main Tank Boost Pump	2/Tank	8	*	(B) One pump per tank may be inoperative. Open affected pump CB. Crossfeed and isolation valves shall be operative.
6-4. Auxiliary Tank Boost Pump	2/Tank	8	*	(B) One pump per tank may be inoperative. Both pumps may be inoperative if tank is not serviced with fuel; refuel valve may be failed closed. If both pumps are inoperative and fuel is required, consider using a boost pump from an aux/extended range tank with two operative pumps.
6-5. Extended Range Tank Boost Pump	2/Tank	8	*	(B) One pump per tank may be inoperative. Both pumps may be inoperative if tank is not serviced with fuel; refuel valve may be failed (closed only). If both pumps are inoperative and fuel is required, consider using a boost pump from an aux/extended range tank with two operative pumps.
6-6. Main Fuel Boost Pump Out Light	4	4	3	(B) Both pumps shall be operative. Place both boost pumps on. One-time flight to repair capable facility. MAJCOM approval required when more than one light is inoperative.
6-7. Engine Fuel Boost Pump Pressure Low Light	4	4	3	(B) Both main boost pumps shall be operative. Place both boost pumps on. One-time flight to repair capable facility. MAJCOM approval required when more than one light is inoperative
6-8. Fuel Jettison Valve	2	2	1	(B) One valve may be inoperative (failed closed) if all separation valves are operative.
6-9. Fuel Temperature Selector	1	1	1	
6-10. Fuel Temp Indicator	1	1	1	
6-11. Main Tank Fill Valve	4	4	3	(B) One valve may be inoperative (failed open). Control fuel level with associated aux/ext range tank boost pumps. One-time flight to repair capable facility.
6-12. Aux Tank Refuel Valve	4	4	0	(B) Valves may be inoperative (failed closed) if the tank is not needed for fuel. If fuel is required in any Aux or Extended Range tank, refer to paragraph 4.9.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
6-13. Extended Range Tank Refuel Valve	4	4	0	(B) Valves may be inoperative (failed closed) if the tank is not needed for fuel. If fuel is required in any Aux or Extended Range tank, refer to paragraph 4.9.
6-14. Isolation Valve	4	4	3	(B) One valve may be inoperative (failed closed) if not needed for other fuel transfer methods. Respective crossfeed valve shall be operative. One-time flight to repair capable facility.
6-15. Separation Valve	3	3	2	(B) Center separation valve may be failed closed if both aerial refuel isolation valves are operative. Outboard separation valves may be failed closed if the respective Isolation and crossfeed valves are operative.
6-16. Crossfeed Valve	2	2	1	(B) One valve may be inoperative (failed closed), if not needed for other fuel transfer methods. Respective isolation valves shall be operative. Shall be repaired at next repair capable facility.
6-17. Ground Refuel Isolation Valve	2	2	1	(B) If center separation valve is inoperative (failed closed), both AR Isolation Valves shall be operative.
6-18. Manifold Press Low Light	4	4	2	(B) Inboard lights may be inoperative provided the associated manifold pressure gauge is operative.
6-19. Fuel Manifold Pressure Indicator	2	2	1	Mission dictates requirement. Both shall be operative for planned air refueling. (B) Separation valves and manifold press low lights shall be operative.
6-20. Sump Low Warning	2	2	0	(B) The system shall be made safe prior to flight. Associated outboard main tank boost pumps (2) shall be operative. Refer to T.O. 1C-5A-1, Section 3, SUMP LOW WARNING LIGHT PROCEDURES.
6-21. Main Tank Low Light	2	2	0	(B) Monitor fuel gauges for proper fuel sequence. Shall be repaired at next repair capable facility.
6-22. Vent Fill Light	2	2	0	(B) Control fuel level with associated aux/ext range tank boost pumps to preclude over filling. Shall be repaired at next repair capable facility.
6-23. Fuel Quantity Totalizer	1	1	0	(B) Serviced tanks must have operative indicators. Shall be repaired at next repair capable facility.
6-24. Fuel Quantity Indicators				All fuel quantity indicators necessary for air refueling shall be operative (may be waived by MAJCOM). Do not launch with more than one inoperative fuel quantity indicator per wing. Symmetrically opposite indicator shall be operative.
a. Main Tank Fuel Quantity Indicator	4	4	3	(B) No more than one indicator may be inoperative.
b. Auxiliary Tank Fuel Quantity Indicator	4	4	*	Mission dictates requirement. If fuel is required, see Paragraph 12.15. If fuel is not required in a tank with an inoperative indicator, verify the tank is empty prior to flight.
c. Extended Range Tank Fuel Quantity Indicator	4	*	*	

4.9. Fuel System. It is preferred to use standard fuel system management to the maximum extent possible. Comply with T.O. 1C-5A-1, Sections 2 and 5 if nonstandard fuel sequencing is required for a one time flight to the nearest repair capable facility.

4.9.1. For Ground Refueling Procedures with Inoperative Fuel Quantity Indicator, refer to **Paragraph 12.15.**

4.9.2. Fuel Quantity Indicator Failure In Flight.

4.9.2.1. Line Missions. Comply with T.O. 1C-5A-1, Section 3. Continue as scheduled provided Item 6-24 Remarks/Limitations/Exceptions are met and the destination has capability to safe affected tank IAW T.O. 1C-5A-2-5.

4.9.2.2. Local Missions. Comply with T.O. 1C-5A-1, Section 3 and land as soon as practical. Flight may resume provided Item 6-24 Remarks/Limitations/Exceptions are met, maintenance personnel determined the nature of the malfunction, and the tank has been made safe IAW T.O. 1C-5A-2-5.

4.9.2.3. Air Refueling Missions.

4.9.2.3.1. Normal Procedures (Non Fuel Emergency).

4.9.2.3.2. Line Missions. Comply with T.O. 1C-5A-1, Section 3. Symmetrically opposite indicator shall be operative. Do not air refuel with more than one inoperative fuel quantity indicator per wing.

4.9.2.3.3. Local Missions. Do not conduct air refueling with an inoperative indicator until maintenance action has been performed (see **Paragraph 4.9.2.2.**).

4.9.2.3.4. Abnormal Procedures.

4.9.2.3.5. Servicing. During air refueling, fuel is placed in tanks with operative indicators first. Tanks with inoperative indicators should be serviced internally by transferring a known quantity from another tank.

4.9.2.3.6. Unless T.O. 1C-5A-1, Section 5, Maximum Allowable Fuel Differential limits are going to be exceeded, do not accomplish internal servicing until termination of refueling. However; if necessary, internal servicing may be accomplished in the precontact position.

4.9.2.3.7. When a main tank indicator is inoperative and total main tank fuel quantity is less than 30,000 pounds, simultaneously fill all main tanks prior to servicing other tanks using the following procedures:

4.9.2.3.8. Position the AUTO REF switch to MAN for transfer. Monitor symmetrically opposite indicator to judge quantity in tank with inoperative indicator.

4.9.2.3.9. After filling the main tanks, disconnect and obtain an off-load report to verify the quantity of fuel in the tank with the inoperative indicator. Air refueling may continue after confirming main tank fuel quantity. Further servicing of a tank with an inoperative indicator should be made using known quantities from internal sources.

4.9.2.3.10. If a fuel imbalance is suspected (heavy wing or excessive aileron trim requirements), terminate air refueling and obtain an off-load report. Prior to internal fuel transfer, verify quantity of fuel in tanks with inoperative indicators. Refueling may be continued after fuel is balanced.

Table 4.7. Electrics.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
7-1. AC Load Meter	5	5	3	Shall be operative for each working generator.
7-2. AC Volt Meter	1	1	1	
7-3. Gen Volt & Frequency Selector Switch	1	1	1	
7-4. Battery	2	2	1	One-time flight to repair capable facility. Disconnect inoperative battery.
a. Battery (Modified by 1C-5-736)	1	1	1	
7-5. Battery Light	1	1	0	One-time flight to repair capable facility.
7-6. Battery Switch	1	1	*	Shall be able to select and turn off operable battery. One-time flight to repair capable facility.
a. Battery Switch (Modified by 1C-5-736)	1	1	1	Normal and bypass positions shall be operational.
7-7. Bus Ties	4	4	3	One BTC may be failed (open only) provided associated generator and GLC is operative. One-time flight to repair capable facility.
7-8. Bus Tie Open Light	4	4	4	
7-9. CSD	4	4	3	One may be inoperative and disconnected provided the bus tie system (all functions) is operative. The oil level of the disconnected CSD will be checked for proper oil quantity prior to flight and during all subsequent en route stops. Do not fly more than 50 hours with a disconnected CSD (nonwaiverable).
7-10. CSD Fail Warning	4	4	3	Shall be operative for each working generator/CSD.
7-11. CSD Temperature Gauge	4	4	3	May be inop if CSD Fail light is operative.
7-12. DC Load Meter	2	2	1	Shall be operative for corresponding T/R.
7-13. DC Volt Meter	1	1	0	Prior to applying electrical power, check battery voltage using external meter. One-time flight to repair capable facility.
7-14. DC Volt Meter Selector Switch	1	1	0	One-time flight to repair capable facility.
7-15. Emergency Bus Power Relay	1	1	1	
7-16. Emergency Generator	1	1	1	
7-17. Engine Driven Generator	4	4	3	One may be inoperative provided the bus tie system (all functions) is operative. SCM airplanes on Shuttle Container Transport missions, shall have all 4 generators operative.
7-18. Frequency Meter	1	1	1	

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
7-19. Generator Fail Light (Engines)	4	4	3	Shall be operative for each working generator.
7-20. Generator Fail Light (APU)	2	2	1	Shall be operative for each working APU.
7-21. Generator Out Light (Engine)	4	4	3	Shall be operative for each working generator.
7-22. Generator Out Light (APU)	2	2	1	If inoperative, do not select associated APU generator.
7-23. Generator Load Controller	4	4	3	Shall be operative for each working generator.
7-24. Isolated Bus Switch	1	1	1	
7-25. 325 Amp Current Limiter	1	1	1	
7-26. 400 Amp Current Limiter	1	1	0	Both transformer rectifiers shall be operative. One-time flight to a repair capable facility.
7-27. Phase Selector Switch	1	1	1	
7-28. #1 Avionics AC Bus Off Warning Light and Relay	1	1	0	If light and/or relay are inoperative, open the INS Emer Switch C/B on Avionics AC Bus #1. In this configuration, normal INS attitude switching is possible. One-time flight to repair capable facility.
7-29. Transformer Rectifier	2	2	1	400 amp current limiter shall be operative. One-time flight to nearest repair capable facility.
7-30. Aircraft Lighting				See AFI 11-202V3 requirements. Nav lights (at least one bulb in each position) required for night operations. Anticollision lights (1 upper and 1 lower) required for day or night operations. Strobe lights may be inoperative.

Table 4.8. Instruments.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
8-1. Flight Director System	2	2	1	Both required for CAT II ILS.
8-2. Go-Around Attitude Subsystem	1	1	0	
8-3. Navigation Selector Panel	2	2	*	Portions may be inoperative. Available approaches and/or mission dictate requirement.
8-4. Auxiliary Navigation Selector Panel	2	0	0	
8-5. Pilot Bearing Distance Heading Indicator (BDHI)	2	2	*	Mission and available approaches dictate requirement.
8-6. Horizontal Situation Indicator (HSI)	2	2	1	Shall be repaired at next repair capable facility. Pilot with inoperative HSI shall have an operative BDHI.
8-7. Remote HSI Heading and Course Selector Panels	2	0	0	HSI heading and course selectors must be operative.
8-8. Attitude Director Indicator	2	2	2	
8-9. Rate-of-Turn Sensor	2	2	*	(B) One must be operative for flight in IMC. With inoperative indicator, corresponding ADI must be operative.
8-10. Central Air Data Computer (CADC)	2	2	2	When one CADC is replaced, and the pitot static system has not been disturbed, a leak check may be deferred. Cross-check pilot and copilot airspeed indicators at 80 knots on takeoff roll. Abort the takeoff if airspeed differs by five knots or more. Exception: Maintenance leak and accuracy checks are required before flights in RVSM airspace
a. CADC drain bottles				If test equipment is not available and any portion of the colored indicator float ball is at or above the beveled edge of the bottle(s) specified bottle(s) may be drained. Strictly adhere to T.O. 1C-5A-2-6. Airplane will not be RVSM capable and will require an 80 knot cross check.
8-11. Magnetic Compass	1	1	1	
8-12. Accelerometer	1	1	0	MADAR shall be capable of monitoring in-flight loads.
8-13. Vertical Scale Flight Instruments (VSFI)				
a. AoA Indicator	2	2	0	At least one stallimeter shall be operative.
b. Mach Indicator	2	2	0	Use corresponding calibrated airspeed to maintain desired Mach.
c. Airspeed Indicator	2	2	2	
d. Vertical Velocity Indicator (VVI)	2	2	2	
e. Altimeter	2	2	2	

Table 4.9. Avionics.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
9-1. VHF Command Radio	2	2	1	
9-2. UHF Command Radio	2	2	1	
9-3. L-Band SATCOM	1	*	*	Mission dictates requirement. Notify 618 TACC if inoperative (N/A locals). NOTE: L-Band SATCOM N/A for all AMP modified airplanes.
9-4. VHF Nav Radio	2	2	1	
9-5. HF Radio	2	2	*	(B) Mission dictates requirement.
9-6. ADF				
a. A-model aircraft	2	1	*	Mission dictates requirement.
b. B-model aircraft	1	1	*	Mission dictates requirement.
9-7. TACAN	2	2	1	When possible, install in the #1 position.
9-8. Marker Beacon	1	1	0	Available approaches dictate requirement.
9-9. Inertial Navigation Systems (INUs)	3	3	2	Three sources of attitude required (includes SAI). One INU inoperative procedure: Two fully operative INUs required. These should be installed in the #1 and #3 positions. Line missions--shall be repaired at next repair capable facility.
9-10. Fuel Savings Advisory System (FSAS)				
a. FSAS Computer	1	1	*	Required for wind shear warning and flights in RVSM airspace (altitude alerting).
b. Display Interface Control Unit (DICU)	1	1	*	Required for flights in RVSM airspace (altitude alerting).
9-11. Standby Attitude Indicator				
a. SAI	1	1	*	See Items 9-9 and 9-18a Remarks/Limitations/ Exceptions. Line missions--shall be repaired at next repair capable facility.
b. Air Data Unit	1	0	0	
9-12. CADC Select Switch	1	1	*	Required for flights in RVSM airspace.
9-13. IFF	1	1	1	Mode 3A and C shall be operative.
a. Mode 4 Computer	1	1	0	(B) Do not delay takeoff except when the aircraft will transit an area where safe passage procedures are implemented. In-flight failures: Continue to intended destination. Where safe passage is implemented, follow procedures for inoperative Mode 4.
9-14. TCAS System	1	1	0	Shall be repaired at next repair capable facility.
a. TCAS Displays	2	1	1	Functional display may be installed at either position.
b. Mode S	1	0	0	Mission requirements dictate.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
9-15. Interphone System				Shall be able to communicate with all occupied positions.
a. Cockpit Loudspeaker	3	3	1	
b. Microphone Switch (Yoke)	2	2	1	Shall be repaired at next repair capable facility.
c. Microphone Switch (Floor)	2	1	*	Should be operative at engineer position.
9-16. Public Address (PA) System	1	1	0	(B) If inoperative in troop compartment, interphone communications shall be maintained.
a. Troop Compartment PA	1	1	*	(B) Shall be operative when carrying passengers unless other means of communication is available (i.e., bullhorn).
9-17. Avionics Equipment Cooling System				
a. Avionics Cooling Fan	2	2	1	Shall be repaired at next repair capable facility.
b. Cooling Fan Fail Light	2	2	1	Light shall be operative for selected fan.
c. COMPT OVHT Light	1	1	0	Periodically scan avionics compartment. Shall be repaired at next repair capable facility.
d. Cooling Effects Detector	1	1	0	Periodically scan avionics compartment. Shall be repaired at next repair capable facility.
f. Panel Fan Fail Light	1	1	0	Periodically check fan in-flight. One-time flight to repair facility.
9-18. Flight Management System (FMS)				
a. Control Display Unit (CDU)	3	3	2	Operative units should be installed in the #1 and #3 positions. INU associated with the inoperative CDU will not be operative. SAI shall be operative. Line missions--shall be repaired at next repair capable facility.
b. Bus-Subsystem Interface Unit (BSIU)	3	3	3	
c. Data Loader	1	1	*	Mission dictates requirement.
d. GPS Key Fill Panel	2	1	*	Mission dictates requirement.
e. FMS/INS Status Panel	2	2	1	(B) Attd Fail, Hdg Fail, and CDU Msg indicators should be operative. If these lights are inoperative, one-time flight to repair facility. Monitor associated CDU.
f. FMS Aux Control Panel	1	1	1	
g. FMS Master Power Control Panel	1	1	1	
h. Comm/Nav Radio Volume Control Panel	1	1	1	Portions may be inoperative; mission requirements dictate.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
i. GPS Receiver Processor Unit (RPU)	3	3	0	(B) CDU with operative RPU must be installed in the pilot position. If a second is installed, it should be placed in the co-pilot position. Select the working GPS for the integrated nav solution. If all three RPUs are inoperative, all CDUs must be functional to place INUs in triple mix; refer to FLIP for RNP requirements. Line missions--shall be repaired at next repair capable facility. NOTE: One functional GPS receiver required for NVG landings.
j. GPS Antenna	2	2	0	(B) Select the working GPS for the integrated nav solution. If both antennae are inoperative, all CDUs must be functional to place INUs in triple mix. Refer to 9-18i Remarks/Limitations/ Exceptions.
k. GPS Antenna Electronics Unit (AEU)	2	2	0	(B) Select the working GPS for the integrated nav solution. If both AEUs are inoperative, all CDUs must be functional to place INUs in triple mix. Refer to 9-18i Remarks/ Limitations/ Exceptions.
9-19. Radar Altimeter	2	2	1	Considered operative with either analog or digital display. (B) For GPWS signals, pilot position should be operative. Both required for CAT II ILS approaches.
9-20. Weather Radar	1	1	*	(B) Shall be operative for all flights into areas of known or forecast thunderstorms.

Table 4.10. Recording and Emergency Location.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
10-1. Emergency Locator Transmitter (ELT)	1	1	1	May be inoperative for local airland flights at or in the vicinity of home station. FIR shall be operative.
10-2. Flight Incident Recorder (FIR)	1	1	0	FIR may be inoperative provided CVR is operative. Shall be repaired at next repair capable facility.
10-3. Cockpit Voice Recorder (CVR)	1	1	0	CVR may be inoperative provided FIR (including all FIR inputs) is operative. Shall be repaired at next repair capable facility.

Table 4.11. MADAR. (Refer to Paragraph 4.10.)

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
11-1. Signal Acquisition Remote (SAR) Units				
a. SAR 03, 04, 19, 20, 21, 22	1	1	0	Required for FIR input and engine vibration monitoring. Refer to paragraph 4.10.
b. SAR 01, 05, 13, 14, 17, 18, 27, 28, 29	1	1	0	Required for FIR input.
11-2 MADAR III				
a. MDCR Workstation	1	1	0	Shall be repaired at next repair capable facility. Comply with Item 9-3 for inoperative L-Band SATCOM.
b. POU	1	1	0	MDCR should be operative. If both MDCR and POU are inoperative, shall be repaired at next repair capable facility.
c. Communications controller	1	1	0	Repair at next repair capable facility. L-Band, MDCR, and POU will be inoperative.
d. MDCR Media	1	1	0	Shall be repaired at next repair capable facility.
e. Multiplexer/Processor (MUX/PROC)	1	1	0	Required for FIR input. Shall be repaired at next repair capable facility.
f. Power Supply (P/S)	1	1	0	Required for FIR input. Shall be repaired at next repair capable facility.
g. Signal Conditioner/Multiplex (SCM)	1	1	0	Required for FIR input. Shall be repaired at next repair capable facility.

4.10. MADAR operational procedures.

4.10.1. Both Engine Vibration Indicating (EVI) channels indicating vibration (fan or core) out of limits will require confirmation of engine condition by ground test equipment. MADARS may be used for confirmation of engine condition if ground test equipment is not available.

4.10.2. One EVI channel indicating vibration (fan or core) out of limits and the other channel inoperative will require confirmation of engine condition by ground test equipment.

4.10.3. One usable EVI channel indicating a vibration (fan or core) out of limits and one usable SAR channel indicating within limits suggests an indicating system malfunction. To determine if an indication malfunction exists apply the following:

4.10.3.1. If channel 08 mil value is more than 2.5 times greater than the channel 09 mil value or the channel 09 value is more than 1.1 times greater than the channel 08 value, an indicating system malfunction exists.

4.10.3.2. If an indicating system malfunction exists, the usable channel indicating vibration within limits will be used. Record the system malfunction as a discrepancy as in the AFTO Form 781A.

4.10.3.3. If an indicating system malfunction does not exist, the usable channel indicating the highest values will be used to determine vibration levels.

4.10.4. If engine vibration monitoring is inoperative, verify engine vibration history through maintenance channels using the aircraft discrepancy history (G-081) or equivalent. If a discrepancy is found, verify it is for an actual engine vibration not the indicating system. If there is actual recurring engine vibration history in last 200 hours, the vibration indicating system shall be repaired.

Table 4.12. Cargo Door System (Troop & Cargo).

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
12-1. Visor and Forward Ramp	1	1	1	May depart if manual override is required to open, close, or lock the visor or forward ramp assembly. (A) Do not depart with inoperative or missing locks on the visor and forward ramp. (B) Door locks may be inoperative if all locks are confirmed locked. Mission dictates requirement.
12-2. Forward Ramp Manual Locking Pin	8	8	8	(B) If locking ball is missing, secure pin with safety wire and annotate in 781A
a. Yellow Streamer	8	8	0	
b. Mechanical Lock Indicator	10	10	0	Verify all locks are locked; lock indicator lights shall be operative. Do not delay launch, repair as soon as practical.
12-3. Visor Door Mechanical Lock Indicator	23	23	0	Verify all locks are locked; lock indicator lights shall be operative. (B) Do not delay launch, repair as soon as practical.
12-4. Ramp Extension Support Jack	4	4	*	Mission requirements dictate. Refer to T.O. 1C-5A-9 for loading limitations when less than four jacks are serviceable.
12-5. Aft Cargo Doors and Ramp	1	1	1	(A) Do not depart with inoperative or missing locks on the aft ramp, pressure, side or center doors. Do not depart when manual override is required to open, close, or lock the side, center, pressure doors, or aft ramp assembly. Do not depart when aft side cargo door sag interrupts normal electrical operation of the doors. (B) May use hydraulic manual override to operate the door system. Door locks may be inoperative if it can be determined the lock is positively locked, mission dictates requirement.
12-6. Aft Ramp Manual Locking Pin	14	14	14	(B) If locking ball is missing, secure pin with safety wire and annotate in 781A
a. Yellow Streamer	14	14	0	
b. Mechanical Lock Indicator	14	14	0	Verify all locks are locked; lock indicator lights shall be operative. (B) Do not delay launch, repair as soon as practical.

Table 4.13. Oxygen System.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
13-1. 25 Liter Converter	1	1	0	(B) 25 liter converter may be inoperative provided the other converter is serviced with an adequate quantity for the proposed mission. May result in passenger limitations. Line missions--shall be repaired at next repair capable facility.
13-2. 75 Liter Converter	1	1	0	(B) 75 liter converter may be inoperative provided the other converter is serviced with an adequate quantity for the proposed mission. Will result in passenger limitations. Line missions--shall be repaired at next repair capable facility.
13-3. Oxygen Shut-off Valve	1	1	1	
13-4. Recharging Hose	10	10	*	No more than one inoperative per compartment. Shall be repaired at next repair capable facility.
13-5. Flight Crew Oxygen Regulator	5	5	*	P, CP, FE, and N (if applicable) positions shall be operative
13-6. Relief Bunk Oxygen System	6	6	0	Do not occupy bunk with inoperative regulator above FL 250.
13-7. Continuous Flow Oxygen Regulator	2	2	2	
13-8. Drop-Down Mask	101	*	*	One per passenger in each compartment. May result in passenger limitations.
13-9. Oxygen Quantity Indicator (25 liter)	1	1	0	(B) 75 liter indicator shall be operative. If servicing capability exists, service 25 liter converter prior to launch.
13-10. Oxygen Quantity Indicator (75 liter)	1	1	0	(B) 25 liter indicator shall be operative. If servicing capability exists, service 75 liter converter prior to launch.
13-11. Quantity Low Light	2	2	1	When serviced, corresponding gauge shall be operative.
13-12. Oxygen Quantity Indicator (25 liter) Test Switch	1	1	0	When serviced, corresponding gauge shall be operative.
13-13. Oxygen Quantity Indicator (75 liter) Test Switch	1	1	0	When serviced, corresponding gauge shall be operative.
13-14. Oxygen Warning System	1	1	1	(B) Not required for flights below 10,000 ft MSL. Shall be repaired at next repair capable facility. If passengers are on board, and the oxygen warning system is inoperative, the flight is limited to 10,000 ft MSL. If flight above 10,000 ft MSL is required, the crew will be on oxygen.
13-15. EPOS	88	*	*	One per passenger in each compartment. May result in pax limitations.
13-16. Portable Oxygen Bottles	16	16	12	(B) Ensure all troop compartment bottles are operative if troop compartment is occupied. If all troop compartment bottles are inop, crewmembers entering the troop compartment in flight must carry a supplemental oxygen bottle.

Table 4.14. Warning Systems.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
14-1. Stallimiter System	2	1	1	One fully functioning system required for all departures.
14-2. Ground Proximity Warning System (GPWS)	1	1	0	If the GPWS is inoperative due to a bad radar altimeter in the pilot position, replace with copilot's radar altimeter. (B) Shall be repaired at next repair capable location.
14-3. Wind Shear and Altitude Alert Warning	1	1	0	Altitude alerting - RVSM airspace requirement. (B) Wind shear - Requires operable FSAS. If the wind shear alert/warning function is inoperative, the flight engineer will provide reference ground speed per T.O. 1C-5A-1.
14-4. Master Caution System	1	1	1	As long as safety-of-flight is not affected, some annunciator lights may be inoperative (e.g., flare inop, nose loc ant off, etc.). System shall be able to be reset. Aircraft may be flown with an annunciator light that will not reset as long as the master caution resets. Engineer caution panel shall be operative. Pilot/Copilot Master Caution/ Auto lights shall be operative.
a. Master Caution Light	2	2	1	
b. Master Auto Light	2	2	1	
14-5. Door Warning System (Lock Status Lights)				
a. Visor	25	25	24	All Visor Lock Status lights shall be operative. (B) If all T.O. 1C-5A-1 Section 3 criteria are met, one lock may be in bypass. Repair as soon as practical.
b. Forward Ramp	2	2	0	(B) Lights may be inoperative provided mechanical pins are installed and the locks are verified to be locked. Repair as soon as practical.
c. Crew Entrance Door	1	1	1	
d. Aft Ramp	2	2	0	(B) Lights may be inoperative provided mechanical pins are installed and the locks are verified to be locked. Repair as soon as practical.
e. Fwd Underfloor Access Door	1	1	0	(B) Light may be inoperative provided the door is verified to be closed and locked. Repair as soon as practical.
f. Aft Winch Access Hatch	1	1	0	(B) Light may be inoperative provided the door is verified to be closed and locked. Repair as soon as practical.
g. Aft Bilge Access Hatch	1	1	0	(B) Light may be inoperative provided the door is verified to be closed and locked. Repair as soon as practical.
h. Forward Bilge Access Hatch	1	1	0	(B) Light may be inoperative provided the door is verified to be closed and locked. Repair as soon as practical.
i. Left and Right Side Cargo Doors	4	4	0	(B) Lights may be inoperative provided the door(s) are verified to be locked and the door is closed and locked.
j. Center Cargo Door	2	2	2	

Table 4.15. Fire Suppression System (FSS). (Refer to Paragraph 4.11.)

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
15-1. DEWARS	2	2	1	(B) Flight is permitted with one unserviceable DEWAR provided the system functions remain operative. Some malfunctions may require the DEWAR to be drained.
15-2. Nitrogen Fire Suppression Control Panel	1	1	1	Shall be capable of fire warning and discharge. Exception: Discharge capability is N/A when LN2 is depleted.
15-3. Nose Wheel Well Control Panel	1	1	0	Shall be repaired at next repair capable facility.
15-4. Optical Detection	1	1	0	If any component is inoperative, associated compartment shall be scanned every hour. Smoke detection system shall be fully operative. One-time flight to repair capable facility.
15-5. Isolation Valve	2	2	1	(B) Isolation valve shall be operative for serviced DEWAR.
15-6. Outboard Main Tank ΔP Switch	2	2	0	Do not pressurize wings. Shall be repaired at next repair capable facility.
15-7. Overboard Relief Valves	2	2	1	Not required with unserviced DEWAR.
15-8. Pressure Limiters	2	2	1	Not required with unserviced DEWAR.
15-9. Primary Climb/Dive Valve	2	2	0	(B) Secondary climb/dive valve must be operative. Manual override shall be operative.
15-10. Primary Regulator	2	2	1	Not required with unserviced DEWAR.
15-11. Secondary Climb/Dive Valve	2	2	0	(B) Primary climb/dive valve must be operative. Manual override shall be operative.
15-12. Secondary Pressure Regulator	2	2	1	Not required with unserviced DEWAR.
15-13. Vent Box Float Switch	2	2	2	
15-14. Wing Pressure Warning System	2	2	2	
15-15. Liquid Nitrogen Service Panel	1	1	1	(B) As long as safety-of-flight is not affected, some functions may be inoperative. Repair at next repair capable facility.
15-16. Central Processing Unit (CPU)	1	1	1	Shall be capable of fire warning and discharge. Exception: Discharge capability is N/A when LN2 is depleted.
15-17. FSS Fire Detection	1	1	1	

4.11. FSS Servicing Because of the increased safety margin provided by the FSS, obtain full LN2 servicing at stations with servicing capability.

4.11.1. Minimum Servicing Requirements: Note: Fully serviced is defined as 650 pounds per operational DEWAR to allow for gauge inaccuracies, automatic shutoff settings, and LN2 boil-off.

4.11.2. Home Station Departures. The airplane will be fully serviced.

4.11.3. En Route Stations With Servicing Capability. The airplane will be fully serviced unless directed otherwise by the PIC. **Exception:** Station supply depleted or equipment malfunctions (all servicing trucks inoperative).

4.11.3.1. PIC should pass less than full LN2 requirements for next mission leg during maintenance debrief.

4.11.4. En route Stations Without Servicing Capability. The mission may continue regardless of the amount of LN2 on board. If the remaining LN2 will be depleted prior to the next en route stop, vent wings to retain a fire fighting reserve. Do not vent wings until just prior to descent; make an AFTO Form 781 information entry.

4.11.5. Local Missions. Not less than that required for the planned mission duration (plus an adequate fire fighting reserve). For ERCCs, airplanes will be fully serviced for the first half to ensure the second half will have adequate LN2.

4.11.6. General Requirements.

4.11.6.1. Flight is not permitted with system LN2 (liquid nitrogen) leaks in excess of 50 pounds per DEWAR per 12 hours. Allow 1 hour after servicing for system stabilization prior to start of leak check.

4.11.6.2. Use the following values to calculate the minimum amount of LN2 required by **paragraphs 4.11.3.1** and **4.11.5**. These values are guides; amounts used may vary. Document significant variations in AFTO Form 781. Two hundred fifty (250) pounds required for fire fighting (adequate for one application to the largest zone) plus:

4.11.6.3. Twelve pounds for every 1,000-feet of descent planned during a line or AR mission. EXAMPLE: An AR mission that requires an 8,000-foot descent from initial level off altitude to rendezvous altitude, followed by a final cruise altitude of FL370 will need 540 pounds of LN2. ($8,000 + 37,000 = 45,000$ feet of total descent $\times 12 = 540$ pounds).

4.11.6.4. One hundred twenty (120) pounds will be used for each hour of local transition flying.

4.11.7. Missions expecting to transit a threat environment

4.11.7.1. If nitrogen servicing is not available at the last stop prior to entering the threat environment, FE's will adhere to the following.

4.11.7.2. NON-THREAT ENVIRONMENT LEGS. After departing the last station with servicing capability, vent the wings prior to each descent. Enter an information note in the AFTO FORM 781A each time the wings are vented.

4.11.7.3. THREAT ENVIRONMENT LEGS. Regardless of the nitrogen quantity, do not vent wings on legs into and within threat locations.

4.11.7.4. Nitrogen is not required to fly in a threat environment. If nitrogen is not available, do not delay the mission.

Table 4.16. Emergency Equipment.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
16-1. Life Raft/Survival Kit	4	4	1	(B) Troop compartment rafts may be inoperative or missing; however, total troop passengers will be reduced by 25 per inoperative raft. A raft shall be installed at the #2 escape hatch and #6 service door (#6 service door requirement N/A when troop compartment is unoccupied). Exception: Locals/Depot sorties may operate without a life raft provided the flight will not take place over water; a survival kit will be carried.
16-2. Descent Reel	24	24	*	(B) One per occupant on the flight deck.
16-3. Escape Slide/Exit	5	5	*	The #5 service door slide/exit shall be operational. If troop compartment is occupied, #4 hatch and #6 service door slide/exits shall be operational. Limit troop compartment to 40 pax/crew when 3L and/or 3R troop compartment slide/exit is not operational.
16-4. Escape Rope	8	8	*	(B) Three escape ropes shall be installed in the cargo compartment, one above the troop compartment ladder, and one at each exit in the troop compartment that has an operative life raft or escape slide installed. Troop compartment exits are not considered operative unless an escape rope is installed.
16-5. First Aid Kit	22	22	*	(B) Full complement required when carrying personnel in the troop compartment. If troop compartment is not occupied, a minimum requirement of 5 on the flight deck and 2 in the cargo compartment.
16.6. Fire Extinguishers				
a. A-model aircraft	15	15	9	Minimum of 3 operative extinguishers per compartment. Shall be replaced/repared at next repair capable facility.
b. B-model aircraft	17	17	10	Minimum of 3 operative extinguishers per compartment, plus 1 additional 1-gallon extinguisher in cargo compartment. Shall be replaced/repared at next repair capable facility.
16.7. Life Vest	95	*	*	One per occupant during over water flights. May result in pax limitations.
16-8. Crash Axe	3	3	2	(B) A minimum of one crash axe shall be available on the flight deck and one available in the troop.
16-9. Emergency Exit Light	12	12	*	Required for all operative exits. An emergency exit light may be repaired by replacing (2) 327 bulbs if not charging. Troop compartment lights not required when compartment is unoccupied. May result in pax limitations.
16-10. Rope Ladder	1	1	*	Both release handles required to consider ladder operative. Not required if emergency escape slide and emergency descent reels (1 per occupant) are operative. Shall be repaired at next repair capable facility.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
16-11. FE 1301	20	*	*	Bottles may be inoperative as long as detection system is operative. Two additional 1-gallon fire extinguishers shall be placed in the cargo compartment. If two additional 1-gallon fire extinguishers are not available, one-time flight to repair capable facility.

Table 4.17. Miscellaneous Equipment.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
17-1. Lock Blocks, Pressure Door Hinge	2	2	*	Mission dictates requirement.
a. F-valve Safety Guard	1	1	0	
17-2. Night Curtain	2	*	*	Both required for NVG operations.
17-3. Scroll Checklist Holder	4	2	0	Should be operable at copilot and flight engineer positions.
17-4. Service Door Safety Gate	2	2	0	
17-5. Window Shade	12	*	*	(A) Six required, installed in cargo compartment. (B) Non-tactical--if shades are missing, install six in cargo compartment. If six shades are not available, fabricate covers for cargo compartment windows.
17-6. Winch	2	*	*	One required for all cargo missions.
17-7. Water System, Potable	1	*	*	When serviced, all functions shall be operative. If inoperative, system shall be drained prior to flight.
17-8. Latrines				
a. Crew	1	1	1	One-time flight to repair capable facility.
b. Troop Compartment	2	2	2	One-time flight to repair capable facility. Exception: Mission may continue with both inoperative with C2 concurrence and troop compartment not occupied. Mission may continue with one inoperative with C2 concurrence and troop compartment occupancy IAW Addenda A.

Table 4.18. NVG Minimum Operational Equipment

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
18-1. Wing tip landing lights	2	2	*	Both wing tip landing lights require infrared (IR) filters
18-2. Radar Altimeters	2	2	2	
18-3. Globe Positioning System	3	3	2	Two functioning GPS systems required.
18-4. Radar	2	2	1	One operational scope placed at the pilot position
18-5. Inertial Navigation Systems (INUs)	3	3	3	Fully operational with FSAS
18-6. Secure voice radios	6	6	*	Mission requirements dictate
18-7. TCAS Covers	2	2	*	NVIS compatible covers on operational TCAS
18-8. Instrument panel lighting	*	*	*	NVG compatible lighting required

Table 4.19. Avionics Modernization Program (AMP) Instruments

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
19-1. Multifunction Display Units (MFDU)				
a. Pilots Station	6	6	4	Operable units shall be installed in positions 1,2,4,5.
b. Flight Engineer Station	1	1	1	(B) Operable unit may be taken from pilot positions 3 or 6.
c. Navigator Station	1	*	*	Shall be installed and operational for missions requiring a navigator.
19-2. Cursor Control Panel (CCP)				
a. Cursor Control Device (CCD)	2	2	1	One time flight to repair base. Cross-side function shall be operational. Operable CCD shall be installed on pilot's side.
b. Flight Engineer Station	1	1	1	
c. Navigator Station	1	*	*	Shall be installed and operational for missions requiring a navigator.
19-3. Multifunction Control Display Unit (MCDU)				
a. Pilot	1	1	1	
b. Copilot	1	1	1	
c. Observer	1	1	0	Circuit Breaker for inoperative MCDU will be pulled.

Table 4.20. AMP Avionics

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
20-1. Versatile Integrated Avionics (VIA)	2	2	1	One time flight to nearest repair capable facility. Backup Integrating Processor (BIP) shall be operational. Circuit Breakers for associated VIA and AIU shall be pulled for flight.
20-2. Avionics Interface Unit (AIU)	2	2	1	One time flight to nearest repair capable facility. Backup Integrating Processor (BIP) shall be operational. Circuit Breakers for associated VIA and AIU shall be pulled for flight.
20-3. VIA/AIU Alternate Power Switch	1	1	1	
20-4. Backup Integrating Processor (BIP)	1	1	0	One time flight to nearest repair capable facility. Both VIAs/AIUs shall be operational.
20-5. Bus Subsystem Interface Unit (BSIU)	2	2	2	
20-6 Data Loader	1	1	*	Mission dictates requirement.
20-7. Communication Navigation Panel (CNP)	2	2	0	All MCDUs shall be operational.
20-8. Multi-Mode Receiver (MMR)	2	2	1	CAT II ILS approaches unavailable with single MMR.
20-9. V/UHF Radio	2	2	1	Operational radio shall be placed in the #1 position.
20-10. HF Radio	2	2	*	Mission dictates requirement.
a. Datalink Printer	1	1	*	Mission dictates requirement.
20-11. UHF #3	1	1	1	
20-12. Embedded Global Positioning System/Inertial Navigation System (EGI)	2	2	1	Three sources of attitude required. Micro IRS and standby attitude indicator (SAI) shall be operational. Line missions—shall be repaired at next repair capable station. GPS function may be inoperative.
20-13. Micro Inertial Reference System (Micro IRS)	1	1	0	Three sources of attitude required. Both EGIs and standby attitude indicator (SAI) shall be operational. Line missions—shall be repaired at next repair capable station.
20-14. TCAS System	1	1	0	One time flight to a repair capable facility.
a. Mode S	1	0	0	Mission requirements dictate.
20-15. Enhanced Ground Proximity Warning System (EGPWS)	1	1	0	One time flight to a repair capable facility.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
20-16. Stallimiter System	2	1	1	One fully operational system required for all departures. Disable failed subsystem IAW the flight engineer preflight procedure.
20-17. Radar Altimeters	2	2	1	
20-18. Flight Management System (FMS)	2	2	1	May not transit RNP or RVSM airspace with single FMS
20-19. Standby Attitude Indicator (SAI)	1	1	1	
20-20. Navigation Database	1	1	1	The aircraft must always have a database loaded. May not depart any location with database loading capabilities with an expired database. NOTE: The PIC may request loading of the next period's database if the current database will expire prior to reaching a database capable location. Comply with AFI 11-202V3.

Table 4.21. AMP Flight Controls.

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
21-1. Stability Augmentation System (SAS)				
a. Pitch Augmentation	1	1	0	Shall be repaired at next repair capable facility. Autopilot axis will be inoperative. NOTE: Pitch Augmentation System is operative with one VIA/AIU subsystem/LRU disabled IAW the flight engineer preflight procedure.
b. Lateral Augmentation	1	1	0	Shall be repaired at next repair capable facility. Autopilot axis will be inoperative. NOTE: Lateral Augmentation System is operative with one VIA/AIU subsystem/LRU disabled IAW the flight engineer preflight procedure.
c. Yaw Augmentation	1	1	0	One time flight to repair capable facility. Refer to Yaw Augmentation Inoperative procedures in 1C-5A-1. NOTE: Yaw Augmentation System is operative with one VIA/AIU subsystem/LRU disabled IAW the flight engineer preflight procedure.
d. Yaw Aug Manual Trim	1	1	0	One time flight to repair capable facility.
21-2. AUG Power Switch	1	1	1	
21-3. AFCS Power Switch	1	1	1	
21-4. PACS Roll System	1	1	0	Shall be repaired at next repair capable facility. NOTE: PACS Roll System is operative if the side passing the supplemental system checks is selected IAW the flight engineer preflight procedure.
21-5. PACS Pitch System	1	1	0	Shall be repaired at next repair capable facility. NOTE: PACS Pitch System is operative if the side passing the supplemental system checks is selected IAW the flight engineer preflight procedure.
21-6. ALDCS	1	1	*	Shall be repaired at next repair capable facility. When scheduled for air refueling, every effort should be made to launch with an operative ALDCS. NOTE: ALDCS System is operative with one VIA/AIU subsystem/LRU failed IAW the flight engineer preflight procedure.
21-7. Autopilot	2	2	*	Mission dictates requirement. Pitch autopilot required for flights through RVSM airspace. NOTE: Autopilot System is operative with one VIA/AIU subsystem/LRU disabled IAW the flight engineer preflight procedure.
21-8. Autothrottle	2	2	0	NOTE: Autothrottle System is operative with one VIA/AIU subsystem/LRU disabled IAW the flight engineer preflight procedure.

Table 4.22. AMP Lighting

Item/System	Installed	Required		Remarks/Limitations/Exceptions
		A	B	
22-1 Interior Lights Master Switch	1	1	0	NVIS position shall be operational for NVG operations.
22-2 Pilot/ Copilot AMP Panel Lighting	1	1	*	Mission dictates requirement.
22-3 Flight Engineer/ Navigator AMP Panel Lighting	1	1	*	Mission dictates requirement.

Chapter 5

OPERATIONAL PROCEDURES

5.1. Checklists. A checklist is not complete until all items have been accomplished. Momentary hesitations for coordination items, ATC interruptions and deviations specified in the flight manual, etc., are authorized. Notes amplifying checklist procedures or limitations may be added to the checklists. Currency of notes is a crewmember's responsibility and may be evaluated.

5.1.1. Checklist Inserts. MAJCOM Stan/Evals shall approve the use of checklist inserts IAW AFI 11-215. For AMC and AMC-gained units, AMC/A3V is the checklist insert approval authority. The inserts should be placed at the end of the appropriate checklist or in an in-flight guide. All checklist inserts must have a POC. OGVs shall approve local in-flight guides and inserts not affecting T.O. guidance and procedures.

5.1.2. Abbreviated checklist items that do not apply to the unit's aircraft or mission may be lined out.

5.1.3. Emergency checklists. Either pilot may be required to accomplish an emergency checklist from either seat. The pilot accomplishing the checklist must ensure compliance with all checklist items regardless of which crew position (P, CP) is designated to respond.

5.2. Duty Station. Both pilots shall be in their seats during flight. One of the pilots may be out of their seat for brief periods (approximately 15 minutes) to meet physiological needs. With both pilots in their seats, PICs may authorize rest periods for one pilot occupying a primary duty station during non-critical phases of flight (the other pilot will be awake and alert). Only one pilot, or the flight engineer, may be absent from their duty station at a time. When additional aircrew personnel are on board, the observer's seat should be occupied, preferably by a C-5 qualified pilot if available, to assist the crew in avoiding other aircraft during ground operations, takeoffs, departures, penetrations, approaches and landings. Crewmembers will notify the pilot prior to departing assigned primary duty stations.

5.2.1. On augmented missions when two or more ARs are scheduled and the crew contains more than one AR qualified AC, an AR AC, not necessarily the PIC must be in the seat during air refueling operations.

5.3. Flight Station Entry. PICs may authorize passengers and observers access to the flight station during all phases of flight; the total number of persons permitted is limited to the number of seats with operable seat belts and oxygen. Passengers and observers will not be permitted access to primary crew positions.

5.3.1. The PIC may release seats for passenger accommodation in the flight station, relief crew compartment, or courier compartment. A maximum of 20 crewmembers and passengers are authorized seating on the flight deck, subject to oxygen and life vest availability. Consider crew size and duration of flight before releasing seats.

5.3.1.1. When only two loadmasters are on the crew and both are required in the troop compartment, the PIC will designate a C-5 qualified crew member to ensure the safety of passengers on the flight deck. The designated crewmember will not be part of the primary crew, will brief passengers IAW T.O. 1C-5A-1, and will log other time.

5.3.2. PICs may authorize passengers in the troop compartment to visit the flight deck during noncritical phases of flight if turbulence is not forecast and there is a vacant seat on the flight deck for each passenger brought forward. Maximum altitude will be FL350. Passengers will be escorted by a crewmember at all times. A maximum of two escorted passengers may be in the cargo compartment at any time. When above 10,000 feet oxygen must be readily accessible to crew and passengers transiting the cargo compartment.

5.4. Takeoff and Landing Policy. A certified aircraft commander will occupy either the left or the right seat during all takeoffs and landings. **EXCEPTION:** An aircraft commander candidate on an Operational Mission Evaluation satisfies this requirement.

The designated PIC (A-code) is not required to occupy a primary position, but still retains overall authority for conduct of the mission.

5.4.1. An AC or higher will make all takeoffs and landings from the left seat during:

5.4.1.1. Airlift of nuclear weapons.

5.4.1.2. Aircraft emergencies, unless conditions prevent compliance.

5.4.1.3. Category II ILS approaches and landings when the weather is below Category I minimums.

5.4.2. ACs will make all NVG take-offs and landings from the left seat. IPs/EPs may make NVG take-offs and landings from either seat.

5.4.3. Unless the other pilot in the seat is a certified AC or higher, PICs with less than 100 Primary Assigned Aircraft (PAA) hours since AC certification will make all takeoffs and landings under any of the following conditions:

5.4.3.1. Ceiling/visibility less than 300 feet and/or RVR 40 (3/4 SM visibility).

5.4.3.2. RCR less than 12.

5.4.3.3. Crosswind component greater than 15 knots.

5.5. Landing Gear and Flap Operating Policy. The pilot flying (PF) will command configuration changes. The pilot monitoring (PM) will verify appropriate airspeed and configuration prior to echoing the gear or flap actuation command. All gear operation will be activated by the pilot in the right seat and all flap operation will be activated by the PM. **EXCEPTION:** During non-NVG touch-and-go landings the IP/EP will activate the flaps.

5.6. Outside Observer/Jump Seat Duties. Available crewmembers will assist in clearing during taxi operations, and any time the aircraft is below 10,000 feet MSL.

5.7. Seat Belts.

5.7.1. All occupants will have a designated seat with a seat belt.

5.7.2. Crewmembers will have seat belts fastened when occupying a duty position, unless crew duties dictate otherwise.

5.7.3. All crewmembers will have seat belts fastened during taxi and critical phases of flight. Fasten shoulder harness unless crew duties dictate otherwise (The flight engineer is exempt from wearing the shoulder harness during ground operations). For tactical/AR operations, all crewmembers and passengers will have seat belts fastened (unless authorized by the PIC or crew duties dictate otherwise). Crewmembers performing instructor or flight examiner duties are exempt from seat belt requirements if not occupying a primary crew position; however, they will have a seat available with an operable seat belt.

5.7.4. Litter patients, actual or simulated, must remain secured on litters for takeoff and landing.

5.8. Aircraft Lighting. IAW AFI 11-202V3, AFI 11-218, *Aircraft Operations and Movement on the Ground*, and applicable T.O.s.

NOTE: Operations not meeting the aircraft lighting requirements outlined in AFI 11-202V3, are limited to operations within the limits of designated restricted areas. Normal lighting will be displayed outside restricted airspace. Aircraft lighting shall be reduced only to the extent necessary to contribute to realistic training.

5.8.1. NVG Operations. Prepare the aircraft IAW the AMC Aircraft NVG Preparation checklist insert located on the AMC/A3V website.

5.8.1.1. DELETED

5.8.1.2. DELETED

5.8.1.3. DELETED

5.8.1.4. DELETED

5.8.1.5. DELETED

5.8.1.6. DELETED

5.8.2. DELETED

5.8.2.1. DELETED

5.8.2.2. DELETED

5.8.2.3. DELETED

5.8.2.4. DELETED

5.8.2.5. DELETED

5.8.2.6. DELETED

5.8.2.7. DELETED

5.8.3. DELETED

5.8.3.1. DELETED

5.8.3.2. DELETED

5.8.3.3. DELETED

5.8.3.4. DELETED

5.8.3.5. DELETED

5.8.3.6. DELETED

5.8.3.7. DELETED

5.8.3.7.1. DELETED

5.8.3.7.2. DELETED

5.8.3.7.3. DELETED

5.8.3.8. DELETED

5.8.3.8.1. DELETED

5.8.3.8.2. DELETED

5.8.3.8.3. DELETED

5.8.3.8.4. DELETED

5.8.3.9. DELETED

5.8.3.10. DELETED

5.8.3.11. DELETED

5.8.4. DELETED

5.8.5. DELETED

5.8.5.1. DELETED

5.8.5.2. DELETED

5.8.5.3. DELETED

5.8.5.4. DELETED

5.8.5.5. DELETED

5.8.5.6. DELETED

5.8.6. DELETED

5.8.6.1. DELETED

5.8.6.1.1. DELETED

5.8.6.1.2. DELETED

5.8.6.1.3. DELETED

5.8.6.1.4. DELETED

5.8.6.2. DELETED

5.8.6.2.1. DELETED

5.8.6.2.2. DELETED

5.8.6.2.3. DELETED

5.9. Portable Electronic Devices. IAW AFI 11-202V3.

5.9.1. Do not connect unauthorized equipment (laptop computers, video equipment, food preparation equipment, radios/tape players, CD players, etc.) to the aircraft intercom, PA, radio systems, or electrical system. Approved vacuum cleaners are authorized for ground use.

5.9.2. Aircrew members shall not use uncertified Government Furnished Equipment (GFE) or personal devices with RF transmit/receive capability on AMC aircraft carrying hazard class 1 explosive cargo at anytime. Prohibited devices include cellular phones, and laptop computers/PDAs with wireless capability enabled (i.e. Bluetooth). Loadmasters will ensure passengers comply with this restriction. Aircrew members may use certified GFE such as PFPS laptops and PDAs with infrared transmitters.

5.9.3. The following handheld (HH) GPS units meet the requirements of AFI 11-202V3 and may be used with approved laptop computers in flight: Bendix King KLX100 and Garmin GPS 35-USB.

5.9.3.1. The use of HH GPS for moving map display (MMD) is designed as a situational awareness tool and its use is voluntary.

5.10. Tobacco Use on Air Force Aircraft. Tobacco use, to include smokeless (spit/loose) products, is prohibited on Air Force aircraft.

5.11. Advisory Calls. The pilot flying will periodically announce intentions during departures, arrivals, approaches, and when circumstances require deviating from normal procedures. [Table 5.1.](#) through [Table 5.5.](#) depict mandatory calls for nonprecision approaches, precision approaches, climbout and descent, respectively.

NOTE: Automated aircraft advisory calls satisfy the applicable requirements of [Table 5.1.](#) through [Table 5.5.](#)

Table 5.1. Nonprecision Approaches.

PHASE OF FLIGHT	PM CALL	PF RESPONSE
100 feet above FAF altitude	"100 above"	
100 feet above step down altitude	"100 above"	
100 feet above Minimum Descent Altitude (MDA)	"100 above"	
MDA	"Minimums"	
Runway environment in sight	"Runway in sight"	"Landing"
MAP	"Go-around" (1)	"Going-around"

Table 5.2. Precision Approaches.

PHASE OF FLIGHT	PM CALL	PF RESPONSE
100 feet above glide slope intercept altitude	"100 above"	
100 feet above Decision Height Altitude (DH)	"100 above"	
At DH		
- Runway environment in sight	"Land"	"Landing" (3)
- Approach Lights in sight (CAT 1 ILS)	"Continue" (2)	"Continuing"
- Approach lights and/or Runway environment not in sight	"Go-around"	"Going-around"

Table 5.3. Visual/Tactical Approaches.

PHASE OF FLIGHT	PM CALL	PF RESPONSE
500 feet Height Above Aerodrome (HAA)	"500 feet" (4)	
300 feet Height Above Aerodrome (HAA)	"300 feet, stable" or "300 feet, go-around" (5)	"Landing" or "Going-around"

Table 5.4. Climb Out.

PHASE OF FLIGHT	PM CALL	PF RESPONSE
Transition altitude	"Transition, 2992"	"2992"
1000 feet below assigned altitude	"One thousand below"	

Table 5.5. Descent.

PHASE OF FLIGHT	PM CALL	PF RESPONSE
Transition level	"Transition, (state local altimeter setting)" (6)	(6)
1000 feet above assigned altitude	"One thousand above"	

NOTES:

1. The PF will announce his/her intentions to either land or go-around. If the runway environment is not in sight and/or the aircraft is not in position for a normal landing, a go around will be made.
2. With weather at CAT 1 minimums on a CAT 1 ILS, the pilot may not see the runway environment at DH; however, the initial portion of the approach lights will be visible. The pilot may continue to 100 HAT with reference to the approach lights. The pilot may not descend below 100 feet

above touchdown zone elevation using the approach lights as reference unless the red terminating bars or the red side row bars are distinctly visible and identifiable.

3. The PF will announce his/her intentions to either land or go-around. Respond "Landing" if runway environment is in sight, will remain in sight throughout touchdown and the aircraft is in a position for a safe landing.
4. PM will include airspeed deviation and sink rate in feet per minute, e.g. Marker, sink 800 or Plus 10, sink 1000.
5. Stable is defined as, except for momentary deviations, +15 to -5 knots of computed approach speed, no excessive sink rate, and AOA commensurate with the flap setting and no more than 10-degrees of bank required to correct to runway centerline. If these parameters are exceeded the PM will direct a go-around.
6. Both pilots will state the altimeter setting.
7. During climb out and descent the PF will call departing X altitude for Y altitude when initiating altitude changes.
8. Other required calls by the PF are autopilot off/on and autothrottles off/on.

5.11.1. Deviations.

5.11.1.1. The PM the aircraft will inform the other pilot when heading or airspeed deviations are observed, or when the altitude is more than 100 feet from the desired, and no attempt is being made to correct the deviation.

5.11.1.2. Any crewmember seeing a deviation of 200 feet altitude or 10 knots in airspeed, or a potential terrain or obstruction problem, will immediately notify the pilot. Deviations from prescribed procedures for the approach being flown will also be announced.

5.12. Communications Policy. The Air Force does not give a promise of confidentiality to aircrews regarding their recorded aircraft crew communications. Crewmembers are expected to maintain a high degree of cockpit professionalism and crew coordination at all times.

5.12.1. Sterile Cockpit. Limit conversation to that essential for crew coordination and mission accomplishment during taxi, takeoff, air refueling, approach, landing, and any flight below 10,000 feet MSL.

5.12.2. Aircraft Interphone. Primary crewmembers will monitor interphone during critical phases of flight. Crewmembers will advise the PF before checking off interphone. Crewmembers will ensure personnel on headset, or within listening distance, are cleared prior to discussing classified information over interphone. The PIC may allow the troop compartment loadmaster to go off interphone at cruise provided the public address (PA) system is operative.

5.12.3. Command Radios.

5.12.3.1. The PM normally makes all air traffic control (ATC) radio calls.

5.12.3.2. In terminal areas, all crewmembers (if able) will monitor the command radio unless directed otherwise. A crewmember will be designated to monitor C2 frequencies on the inbound and outbound legs.

5.12.3.3. The pilot operating the radios will notify the crew which radio is primary, and update the crew when the primary radio changes.

5.12.3.4. One pilot will record and read back all ATC clearances; another pilot will monitor and ensure correct readback.

5.12.3.5. Both pilots will monitor UHF and VHF guard emergency frequencies to the maximum extent possible.

EXCEPTION: Only one crewmember is required to monitor guard frequencies during tanker or receiver rendezvous and AR.

5.12.3.6. The Federal Communications Commission (FCC) prohibits the use of unauthorized frequencies for interplane, HAVE QUICK, or SECURE VOICE training.

5.12.4. Crew Resource Management (CRM) Assertive Statement Time Out":

5.12.4.1. "Time Out" is the common assertive statement for use by all crewmembers. The use of "Time Out" will:

5.12.4.1.1. Provide a clear warning sign of a deviation or loss of situational awareness.

5.12.4.1.2. Provide an opportunity to break the error chain before a mishap occurs.

5.12.4.1.3. Notify all crewmembers when someone sees the aircraft or crew departing from established guidelines, the briefed scenario, or that someone is simply uncomfortable with the developing conditions.

5.12.4.2. As soon as possible after a "Time Out" has been called, the aircrew will take the following actions:

5.12.4.2.1. Safety permitting, stabilize the aircraft.

5.12.4.2.2. The initiating crewmember will voice their concerns to the crew.

5.12.4.2.3. The PIC will provide all other crewmembers with the opportunity to voice inputs relative to the stated concerns.

5.12.4.2.4. After considering all inputs, the PIC will direct the aircrew to continue the current course of action or direct a new course of action.

5.12.5. Movement of Personnel Between Flight Station and Troop Compartment.

5.12.5.1. The flight engineer will monitor movement of personnel in the cargo compartment. Individuals will notify the flight engineer when entering/exiting the cargo compartment. The engineer will notify the pilot that personnel are en route to/from the troop compartment. The pilot will prohibit movement through the cargo compartment if it is not safe.

5.13. Transportation of Pets. Transporting pets (dogs and cats) in conjunction with the sponsor's permanent change of station is authorized. Other pets or animals are normally prohibited, but may be moved according to DoD 4515.13R.

5.14. Alcoholic Beverages. The MAJCOM/A3/DO may authorize the dispensing of alcoholic beverages.

5.15. Runway, Taxiway, and Airfield Requirements.

5.15.1. **Table 5.6.** specifies the minimum runway length, width, and taxiway widths for normal operations. In all cases ensure obstacle clearance requirements are met. Landing distance will not exceed runway available. The MAJCOM DO may waive runway/taxiway width requirements.

Table 5.6. Runway and Taxiway Requirements.

Runway Length	Runway Width	Taxiway Width
*6000-feet/1,830 meters	**147-feet/45 meters	75-feet/23 meters
*HQ AMC/A37V (AFRC NAF/DO for AFRC missions and ANG/DO for ANG missions) may approve operations down to 5,000-feet or 1,525 meters.		
**If a 180-degree turn is required, then 150-feet or 46 meters of stressed pavement (e.g. runway/taxiway intersection) is required.		

5.15.2. Runway Length for Takeoff and Landing. Do not takeoff if computed critical field length exceeds runway available. Minimum runway for a normal landing is landing distance based on a threshold crossing height of 50 feet. Threshold crossing height is defined as the theoretical height above the runway threshold at which the aircraft's glide slope antenna would be if the aircraft maintains the trajectory established by the mean Instrument Landing System.

5.15.2.1. Runway Length for Takeoff and Intersection Takeoffs. Normally, the PF will initiate takeoffs from the beginning of the approved usable portion of the runway. The decision to make intersection takeoffs rests solely with the PIC.

5.15.2.2. Pilots may accomplish intersection takeoffs provided the operating environment (i.e., gross weight, obstructions, climb criteria, weather, etc.) allows a safe takeoff and departure. Calculate takeoff performance based on the runway remaining from the point at which the takeoff is initiated.

5.15.2.3. During operations on runways partially covered with snow or ice, base takeoff computations on the reported runway surface condition (RSC) or RCR for the cleared portion of the runway. A minimum of 50 feet either side of centerline should be cleared. If 50 feet either side of centerline is not cleared, compute takeoff data based on the uncleared portion up to 50 feet either side of centerline.

5.15.2.4. Use of Overruns. If approach end overruns are available and stressed or authorized for normal operations, they may be used to increase the runway available for takeoff. Departure end overruns (if stressed and authorized) may also be used for landing if needed.

5.15.3. Arresting Cables.

5.15.3.1. Do not land on (touchdown on) approach end arresting cables (does not include recessed cables). If the aircraft lands before the cable, the crew should contact the tower to have the cable inspected.

5.15.3.2. Do not takeoff or land over an approach end cable that has been reported as slack, loose, or improperly rigged by NOTAM, automated terminal information service (ATIS), or ATC.

5.15.3.3. Operations are authorized on runways where BAK-12 systems with an eight-point cable tie-down system are installed. When operating from runways equipped with other types of sys-

tems, or if it is unknown whether the BAK-12 system includes eight point tiedowns, aircrews should recognize the increased risk of damage to the aircraft.

5.15.4. Other Airfield Requirements.

5.15.4.1. Consult with HQ AMC/A36AS (Airfield Suitability Branch) for suitability guidance. Once a mission is executed, the PIC is responsible for determining airfield suitability based upon operational need. Airfield certification requirements are detailed in the ASRR.

5.15.4.2. Aircrews and planning agencies will contact HQ AMC/A3AS for all questions pertaining to airfield weight bearing capacity and will review the GDSS/GDSS2/ASRR before all off-station operations. HQ AMC/A3 is the waiver authority for the restrictions in GDSS/GDSS2 Giant Report and ASRR for AMC and AMC-gained aircraft, unless specifically delegated in AFI 11-2MDSV3 or AMCI 11-208. Direct GDSS/GDSS2 Giant Report and ASRR waiver requests to HQ AMC/A3AS. HQ AMC/A3V is the OPR for waivers to airfield restrictions. MAJCOM/A3/DO is the waiver authority for non-AMC missions. The PIC is responsible for waiver compliance. Crews that have access to the World Wide Web will review airfield suitability in the airfield data base via the HQ AMC Aircrew Portal. Consult the ASRR for airfield certification requirements.

5.15.5. RCR Limitations. When no RCR is available, the PIC will refer to the flight manual for standard ICAO conversions based on general runway condition; be conservative when dealing with unknown conditions (e.g., forward operating bases (FOBs), unpaved runways). Minimum RCR for takeoff or landing is the lowest RCR depicted in the T.O. 1C-5A-1-1 (never less than 3). Normally, RCR values are not reported for taxiways and ramps. During periods of reported low RCR, the taxiways and ramps may have an even lower RCR than reported for the runway. The runway surface should be considered wet when water on the runway causes a reflective glare.

5.15.5.1. When RCR or runway surface condition (RSC) reporting is not available, consider the runway surface as wet when there is sufficient water on the surface to cause a reflective glare or when rain is falling.

5.15.6. Wind Limitations. Airfields will be considered below minimums for takeoff and landing when winds (including gusts) are greater than:

5.15.6.1. Maximum wind (any direction)—50 knots.

5.15.6.2. Maximum tailwind component—10 knots.

5.15.6.3. Maximum crosswind components, corrected for RCR, as specified in T.O. 1C-5A-1-1. For actual category II ILS approaches, the maximum crosswind component is 10 knots or as specified in T.O. 1C-5A-1-1, whichever is lower.

5.15.6.4. Maximum crosswind component for landing on NVGs is 15 knots.

5.16. Aircraft Taxi Obstruction Clearance Criteria and Foreign Object Damage (FOD) Avoidance.

Table 5.7. Minimum Taxi Clearance Criteria.

Lateral Clearance Of Component	To An Obstacle	Without Wing Walker	With Wing Walker
Main Gear Pod	Less than 3-feet high	25-feet	10-feet
Outboard Nacelle	3-feet high, but less than 6-feet high	25-feet	10-feet
Wing Tip	6-feet or higher	25-feet	10-feet

5.16.1. Do not taxi an aircraft within 25 feet of obstructions without wing walkers monitoring clearance between aircraft and obstructions. With wing walkers, avoid taxi obstructions by at least 10 feet. Use extreme caution when scanning from inside the airplane. Wing tip and tail growth in turns and the distance from the fuselage to the wing tip make determination of actual clearance very difficult.

EXCEPTION: IAW AFI 11-218 aircraft may taxi without marshalers/wing walkers at home station along fixed taxi lines which have been measured to ensure a minimum of 10 feet clearance from any obstruction and the obstruction is permanent. Parked aircraft are not considered permanent, and 25 feet of clearance, or a wing walker, is required. Home station aircrews must be provide specific written guidance on each area where this exception is used. Transient aircrew will not taxi in these areas.

5.16.2. When taxi clearance is doubtful, use one or more wing walkers. If wing walkers are unavailable, the PIC will deplane one or more crewmembers to maintain obstruction clearance and provide marshaling using AFI 11-218 signals. Use wing walkers, deplaned crewmembers, or a crewmember on interphone positioned at a door to act as an observer while maneuvering on narrow taxiways. During night taxi operations, marshalers will have an illuminated wand in each hand. Wing walkers are only required to have one illuminated wand. Observers should be in a position to see wing walkers at all times (through door or windows) and communicate with the pilot.

5.16.3. FOD Avoidance. Make every effort to minimize the potential for engine FOD. Crews should:

5.16.3.1. Carefully review airfield layout paying particular attention to taxi routes, turn requirements, and areas for potential FOD.

5.16.3.2. Minimize power settings during all taxi operations.

5.16.3.3. Where possible, avoid 180 turns. If it becomes necessary to accomplish a 180 turn on a narrow runway, the turn should be accomplished at an intersection of a link taxiway or at a designated turn around pad. Normally, the airplane is positioned on the opposite side of the runway and the turn is made toward an intersecting taxiway.

5.16.3.4. Where possible, avoid taxi operations that position an engine over an unprepared or un-swept surface. If unavoidable, leave the engine in idle (to the maximum extent possible) until the engine is over an improved surface.

5.16.4. After landing and clearing the runway, and with approval of the PIC, the loadmaster may open the aft cargo door and lower the ramp to prepare for cargo off/onload provided equipment, and cargo remain secure in the cargo compartment.

Table 5.8. Standard Terminology.

Pilot Flying	Pilot Monitoring
“Engage Heading 193”	Press the button portion of the heading select knob to engage heading select mode, and select heading 193.
“Set Heading 193”	Select heading 193. In this case, the aircraft is already in the HDG SEL mode, so the engage command is not used.
“Preset Heading 193”	Rotate the heading select knob to heading 193, placing the hollow heading bug to the new heading for future use. The Heading SEL button is NOT pressed. This command might be used to preset a missed approach heading.
“Engage Heading Select”	Engage the Heading Select mode without changing the selected heading. This command could be used to engage a heading which was previously preset.
“Engage Heading Hold”	Engage heading hold mode.
ATC issues a heading, the autopilot is OFF.	Without direction from the PF, the PM selects the heading and engages HDG SEL mode. Both pilots confirm the new heading and, if it changed, the new FMA of HDG SEL
ATC conditional clearance: Fly current heading, turn left 060 passing 3,000 feet. “Engage HDG HOLD, Preselect Heading 060”	PM engages Heading Hold and preselects heading 060.
“Engage Speed 250”	Press the speed button to engage Speed Mode, and set 250 KIAS.
“Set Speed 250”	PM changes the speed to 250
“Select Vertical Speed 1000 Up”, or “Set 1000 Up”	Press the vertical speed button, if required, and selects 1000 fpm up.
“Engage Flitch, Speed 210”	PM Press the FL CH button and then change the speed window to 210 KIAS. Normally, a speed is issued with a FL CH command due to the latch feature of the airspeed when FL CH is engaged.
“Engage VNAV, speed intervene 270”	Push the VNAV button, then push the speed intervene and set 270KIAS

Pilot Flying	Pilot Monitoring
“Arm NAV RAD”	Push the NAV RAD button, the PF expects to see a cyan FMA indicating an armed mode (i.e. LOC1).
“Engage Autopilot”	Push the autopilot On button when the PF is within two degrees of pitch and five degrees of bank of the flight director bars (if present)
“Engage Autothrottles”	Push the autothrottles Arm button. This will turn the autothrottles on and a green autothrottle FMA will result.
With the autopilot ON, ATC issues a “climb to 10,000 feet” altitude clearance. Once 10,000 ft is set by PM, the PF confirms the setting and states, “10,000 feet set departing XXXX feet for 10,000 feet.” The PF then engages the appropriate mode (FL CH, VS, VNAV) to begin the climb	The PM selects the new altitude and checks the PFD and states “10,000 feet set.”
Autopilot OFF. ATC issues a “climb to 10,000 feet” clearance. Once 10,000 feet is set by PM, the PF confirms PFD setting, then states, “10,000 feet set, set 1,000 up (or “engage FL CH”), departing XXXX ft for 10,000 feet”	The PM, selects the new altitude and checks the PFD, then states “10,000 feet set. When directed, the PM engages the PF’s requested mode (FL CH, VS, and VNAV) to begin the climb.
Verification of the lateral path by the PF. A “direct to” clearance is issued by ATC. After routing is input by PM, PF verifies routing then states “execute.”	The PM initiates the direct on the “legs” page, verifies the routing and awaits PF confirmation before executing. If required, he or she asks the PF for confirmation. After the PF says “execute”, the PM executes the change.
While on vectors for an approach, the approach needs to be loaded into the FMS.	The PF should verify approach set up before executing the change and commencing the approach.

5.17. Not Used.**5.18. Fuel Jettison Procedures.**

5.18.1. AMC policy is to burn down fuel versus jettison, unless safety of flight dictates an immediate jettison (as determined by the pilot in command). Except in the case of an emergency, before jettisoning fuel, notify the appropriate ATC or flight service facility of intentions, altitude, and location. If available, the PIC will use designated jettison areas, except when safety of flight would be compromised.

5.18.2. For missions tasked by Higher Headquarters Command and Control (C2) agencies, the tasking C2 agency (618 TACC, AMOCC, CAOC, etc.) may authorize fuel jettison when an urgent operational requirement dictates immediate recovery/reconstitution of the aircraft and/or aircrew. The tasking C2 agency may provide fuel jettison instructions in the OPORD, mission directive, SPINS, etc.

5.18.3. For training missions, the OG/CC may approve fuel jettison when an urgent operational requirement exists to expedite recovery of the aircraft and all alternatives have been exhausted.

5.18.4. OG/CCs will establish jettison areas and procedures to minimize the impact of fuel jettisoning. Ideally, establish jettison areas at altitudes above 20,000 feet above ground level, off published airways, avoiding urban areas, agricultural regions, and water supply sources. Avoid circling descents. Initiate AF Form 813, **Request for Environmental Impact Analysis**, and submit it to the base environmental coordinator.

5.18.5. All jettisons will be followed up with a detailed report filed by the pilot in command immediately after landing (AMC Form 97, *AMC In-flight Emergency and Unusual Occurrence Worksheet*). Submit AMC Form 97 through unit OGV to AMC/A3V. Unit OGVs will retain AMC Form 97 for 6 months. Document all pertinent information including the following items:

- 5.18.5.1. Scheduled Duration
- 5.18.5.2. Actual Duration
- 5.18.5.3. Landing Gross Weight
- 5.18.5.4. Computed Stopping Distance
- 5.18.5.5. Recovery Field
- 5.18.5.6. Runway Available
- 5.18.5.7. Jettison Altitude/Location
- 5.18.5.8. Jettison Amount
- 5.18.5.9. Reason for Jettison
- 5.18.5.10. Approval Authority

5.19. Aircraft Speed. IAW AFI11-202V3.

5.20. Bird/Wildlife Aircraft Strike Hazard (BASH) Programs. BASH programs are centralized unit efforts that provide information cross-feed, hazard identification, and a consolidated course of action. As a minimum, unit commanders must implement the following procedures:

- 5.20.1. Ensure compliance with the following Bird Watch condition restrictions.
 - 5.20.1.1. Bird Watch Condition Low - No operating restrictions.

5.20.1.2. Bird Watch Condition Moderate - Initial takeoffs and final landings allowed only when departure and arrival routes will avoid bird activity. Local IFR/VFR traffic pattern activity is prohibited.

5.20.1.3. Bird Watch Condition Severe - All takeoffs and landings are prohibited. Waiver authority is local OG/CC or equivalent. Parent MAJCOM/A3/DO waiver is required to operate at airfields not controlled by the MAF.

5.20.2. Commanders establish Phase II of the BASH program during increased periods of migratory bird activity. Schedulers shall make every effort to not schedule takeoffs, landings, and low-levels from one hour before to one hour after sunrise and sunset during the Phase II period. Publish significant bird hazards in FLIP Area Planning (AP) and the IFR Supplement along with the associated airfield operating hour restrictions and avoidance instructions.

5.20.3. When operating at airfields where no BASH program exists, PIC's have the authority to delay takeoffs and arrivals due to bird condition after coordinating with the appropriate C2 authority.

5.20.4. The PIC should consider bird migratory patterns during the en route portion of the mission to help minimize the potential of an in-flight bird strike. The Bird Avoidance Model (BAM) on HQ AFSC/SEF website contains BASH information including regionalized Continental United States (CONUS) bird migration patterns, Portable Flight Planning System (PFPS) software overlay, and the latest news. The Avian Hazard Advisory system (AHAS) website is another source for real time bird hazard information. Both sites may be accessed through the AMC aircrew mission planning portal. See AFPAM 91-212, *Bird Aircraft Strike Hazard (BASH) Management Techniques*, for additional information.

5.20.5. Following a bird strike, aircrews should land as soon as conditions permit, or as practicable, to have the aircraft inspected by qualified maintenance personnel. Bird strike damage cannot be accurately assessed in-flight, and undetected damage may result in a complex airborne emergency; only qualified maintenance personnel, on the ground, can make reliable damage assessments.

5.21. Functional Check Flights (FCFs) and Acceptance Check Flights (ACFs). AFMC aircrews of the 339 FLTS perform C-5 FCFs and ACFs IAW 1C-5A-6, AFI 21-101, *Aerospace Equipment Maintenance Management*, T.O. 1-1-300, *Functional Check Flights and Maintenance Operational Checks*, and T.O. 1C-5A-6CF-1, *Acceptance and/or Functional Check Procedures Manual*.

NOTE: Normally AMC C-5 Aircrew will not perform FCFs or ACFs

5.21.1. FCFs are performed after accomplishing inspections or maintenance to assure the aircraft is airworthy and capable of mission accomplishment.

5.21.1.1. ACFs specify guidelines for accepting depot aircraft and determine compliance with contractual requirements (e.g., C checks).

5.21.2. FCF Restrictions.

5.21.2.1. In accordance with T.O. 1C-5A-6, conditions requiring an FCF include (but are not limited to) major retrofit modifications, removal or replacement of fixed flight control surfaces, major repairs that would affect the flying characteristics of the aircraft, adjustment, removal or replacement of major components of the flight control system for which airworthiness cannot be verified by maintenance operational checks, removal or replacement of any combination of three engines or three fuel control units, structural repair or high speed taxi check.

5.21.2.2. The decision to approve a combined FCF and ferry flight is the responsibility of the MAJCOM/DO.

5.21.2.3. Only FCF crews shall perform high-speed taxi checks.

5.22. Participation in Aerial Events. See AFI 11-209, *Air Force Participation in Aerial Events*, and the appropriate MAJCOM supplement. Aerial events must be sanctioned and individually approved by the appropriate military authority, and the Federal Aviation Administration (FAA). AFI 11-209 and AMC Supp 1 clearly identifies events sanctioned for support, and specifies the approval authority for each type. AFI 11-209 also stipulates that units participating in aerial events will ensure activities are coordinated with the FAA through the regional Air Force representative.

5.23. Not used.

5.24. Traffic Alerting and Collision Avoidance System (TCAS). It is imperative to follow resolution advisories (RAs) to obtain aircraft separation computed by TCAS. Failure to follow the computed RA may increase the probability of a midair collision. Pilots who deviate from an ATC clearance in response to an RA shall notify ATC of the deviation as soon as practical and promptly return to the ATC clearance when the traffic conflict is resolved or obtain a new clearance.

5.25. Radar Altimeter.

5.25.1. Any crewmember detecting the illumination of the radar altimeter Low Altitude Warning Light will immediately notify the pilot flying the aircraft. Terrain clearance and aircraft position must be verified.

5.25.2. Before departure set the radar altimeter for emergency return. Normally, use the height above touchdown/height above aerodrome (HAT/HAA) for IMC, or 500 feet for VMC departures.

5.25.3. Set the radar altimeter to the HAT/HAA during instrument approaches.

5.26. Not used.

5.27. Reduced Power Takeoffs. Accomplish IAW T.O. 1C-5A-1 and T.O. 1C-5A-1-1.

5.28. Aircraft Recovery from Unprepared Surfaces. Aircrews will not normally attempt to recover an aircraft after inadvertent entry onto unprepared surfaces not suitable for taxi; ground crews will accomplish aircraft recovery. Unless an emergency dictates otherwise, aircrews may only accomplish recovery if there is no aircraft damage, the surface will support the aircraft, and the PIC has coordinated with appropriate MAJCOM headquarters maintenance authorities through 618 TACC, or appropriate C2 agency.

5.29. Engines Running Offload or Onload (ERO) Procedures. MAJCOM/A3 or the Director of Mobility Forces (DIRMOBFOR) may authorize ERO to expedite the flow of aircraft through airfields. Do not use ERO procedures when explosive cargo is involved except when authorized in the JA/ATT exercise operations order or contingency air tasking order.

5.29.1. The PIC may approve onload or offload of personnel and small articles through the crew entrance door. Use T.O. 1C-5A-1, Block in checklist. Open only the crew entrance door and deplane the scanner to assure safety of enplaning or deplaning personnel.

5.29.2. ERO training may be conducted during local training without MAJCOM/A3 approval.

5.29.3. Engine running crew changes during local training missions are authorized, provided the enplaning crew does not approach the airplane until a deplaning crewmember is positioned on headset outside the airplane.

5.30. Use of Automation. FMS 800 and AMP bring a new level of automation to the C-5. It is imperative that crews safely use automation. These procedures provide an outline to maximize use of automation while ensuring safety is not compromised.

5.30.1. General. It is the responsibility of the crew to fully understand the operation and the limitations of automation on the aircraft. In flight, the PF will determine the most desirable level of automation for the given situation. However, the PIC has the ultimate responsibility and authority for the safe operation of the aircraft. The PIC must manage workload, set priorities, and employ available resources, including the automated systems, to maintain maximum situational awareness.

5.30.1.1. Use *appropriate* levels of automation as required by flight conditions. The first priority is always to safely fly the aircraft. The AFCS and FMS/MCDU are intended to aid in task management, not complicate it. As flight conditions change, so should the appropriate level of automation. Do not feel locked into one level of automation.

5.30.1.2. Avoid the common pitfalls of over reliance, misunderstanding, or misuse of automated systems. Some of these are:

5.30.1.2.1. Fixation on automation. One pilot should always remain heads up. Establish clear roles for AFCS and FMS/MCDU related tasks. One technique is to announce “pilot heads down” or “copilot heads down” when the task requires focusing significant attention on the FMS/MCDU in flight.

5.30.1.2.2. Task Management. Extensive programming of the FMS/MCDU below 10,000 feet and during critical phases of flight should be avoided, especially during times of increased workload.

5.30.1.2.3. Mode Awareness. Technical systems knowledge is fundamental. To maximize situational awareness, the PF should verbalize automation mode and level changes to the crew. Confirm inputs by observing the desired result.

5.30.1.2.4. Under monitoring. Cross-confirm inputs. Always back up automation with basic instrumentation and charts. Pilots should constantly back each other up.

5.30.1.2.5. Balance skills. Practice flight operations at all levels of automation to remain proficient. If automation increases workload, decrease its use or take over manually.

5.30.1.3. FMS-800/MCDU Programming. Normally, the PM should make all FMS/MCDU inputs. Any change which will affect the lateral or vertical path should be coordinated with the PF before execution to ensure that the PF is aware of these changes. The PF will acknowledge and approve these changes by saying EXECUTE. The PF may elect to make FMS/MCDU inputs above 10,000’.

5.30.1.4. Use of Other Systems. Any system which increases situational awareness, such as TCAS or WX radar, should similarly be operated by the PM at the direction of the PF. As with delegating tasks to the jump seat occupant, the goal is to have the PF flying, and to have supportive tasks be appropriately managed. This will assist in increasing everyone's situational awareness.

5.30.2. **FMS 800 Operations.** The C-5 FMS 800 is designed to be operated by two pilots. In order to maximize safety and efficiency in a demanding, worldwide theater of operations, multiple automation systems are employed and should be utilized at the most appropriate level.

5.30.2.1. FMS 800 Standard Operating Procedures. The following is intended to be directive but by no means supersedes the safe judgment of the pilot in command.

5.30.2.1.1. FMS 800. Normally the PM will make FMS inputs, especially at low altitudes (e.g. below 10,000 feet). When work load and phase of flight permit, the PF may make FMS inputs. Coordinate route changes between pilots to ensure accuracy.

5.30.2.1.2. Autopilot. When the autopilot is engaged, the PF should operate the autopilot. The PM should only make inputs if directed by the PF.

5.30.3. **AMP Operations.** The C-5 AMP is designed to be operated by two pilots and brings a much higher level of information and automation to the flight deck. Effective crew coordination assures more efficient use of automation. Standard terminology should be employed for more effective communication. The following is intended to be directive but by no means supersedes the safe judgment of the pilot in command.

5.30.3.1. Crew Coordination. To ensure efficient coordination between pilots and thorough accomplishment of cockpit tasks, areas of responsibility are defined by PF and PM designations.

5.30.3.1.1. MCDU. Normally the PM will make MCDU inputs, especially at low altitudes (e.g. below 10,000 feet). Changes which alter the flight path should be verified by the PF prior to execution. The intent is for the PM to accomplish programming, allowing the PF to remain heads up.

5.30.3.1.2. AFCS Operation. AFCS operation is governed by the autopilot status with consideration given to aircraft altitude.

5.30.3.1.2.1. With the autopilot engaged, the PF should make all changes to AFCS modes and settings. EXCEPTION: The Altitude Select Window is set by the PM. In all cases the new altitude setting will be verbally confirmed with the other pilot.

5.30.3.1.2.2. With the autopilot disengaged, the PM should make all AFCS inputs at the direction of the PF. However, when receiving ATC vectors or altitude change clearances, the PM should set assigned headings and engage HDG SEL mode or set the new altitude and await the PF's instructions to engage a vertical mode.

5.30.3.2. Standard Terminology. When directing the PM to make AFCS inputs, clarity is of the utmost importance. Standard terminology aids clarity and brevity and ensures that crews effectively operate in concert with each other, while maintaining situational awareness. Although very precise, standard terminology can unnecessarily congest cockpit communication. Therefore, in-flight context may allow simplified direction and execution. For example "Preselect 10,000" is obviously an altitude command and does not require the noun "altitude" to clearly communicate

the PF's desires. Vertical speeds appended with UP or DOWN are sufficiently clear. Any time the PM is unsure of a command, he/she will ask for clarification. If an uncommanded FMA is displayed, the PF will clearly restate the command and ensure the correct change is made. The following standard terminology will be used:

5.30.3.2.1. SELECT, SET or ENGAGE directs the selection of a value and/or a mode on the AFCS panel which results in the value being placed in the "engaged" (top green) portion of the FMA. SELECT or SET is normally used with rotary knobs, however ENGAGE is acceptable.

5.30.3.2.2. ARM directs the selection of a mode on the AFCS panel which results in the value being in the "armed" (bottom, cyan) portion of an FMA.

5.30.3.2.3. ENGAGE should be used to request autopilot or autothrottle engagement.

5.30.3.2.4. UP or DOWN should be used to indicate a change in vertical speed.

5.30.3.2.5. EXECUTE should be used by the PF to indicate agreement with a programmed change to the flight path.

5.30.3.2.6. PRESET or PRESELECT should be used to change an AFCS value without changing the engaged or armed mode (e.g. when setting a missed approach heading before the missed approach point).

5.30.3.2.7. FL CH may be pronounced "Flitch" for brevity.

5.30.3.2.8. Examples of use. Exact, scripted communication is not as important as clarity. These examples demonstrate how this terminology can be used to ensure clear, efficient communication between pilots. The general framework is action, axis, and setting, e.g. "SELECT SPEED 250".

5.30.3.3. Altitude Select Window. The Altitude Select Window is set by the PM. The commanded altitude depends on the vertical mode to be used for the climb/descent. If using VNAV, the PF may elect to call for the highest level cleared in a climb or the lowest level cleared in a descent. This will allow VNAV management of the climb profile for intervening altitude restrictions. If not using VNAV, set current altitude clearance. Do not preselect a subsequent altitude until an altitude hold or altitude capture FMA is displayed and clearance to that altitude has been issued. At no time should an expected ATC clearance be set in the Altitude Select Window.

5.31. Autopilot and Autothrottle Use. C-5 AMP aircraft autothrottles are approved for use during climb, cruise, decent, and approach. C-5 FMS-800 aircraft autothrottle use is restricted to the approach phase only.

5.31.1. The autopilot will be disconnected no later than DH, departing the MDA, or 300' for visual/tactical approaches.

5.31.2. The autothrottles will be disconnected no later than DH or 100' at all other times.

Chapter 6

AIRCREW PROCEDURES

Section 6A—Pre-Mission

6.1. Aircrew Uniform.

6.1.1. Aircrew will wear the aircrew uniform, as outlined in AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*, and the appropriate MAJCOM supplement, on all missions, unless otherwise authorized. When the Foreign Clearance Guide (FCG) requires civilian attire, crewmembers should dress conservatively.

6.1.2. OG/CCs will determine clothing and equipment to be worn or carried aboard all flights commensurate with mission, climate, and terrain involved.

6.1.2.1. See AFI 11-301V1, *Aircrew Life Support (ALS) Program*, Attachment 1 for minimum aircrew clothing requirements. All crewmembers will have Nomex gloves in their possession.

6.1.2.2. It is recommended that primary crewmembers wear Nomex gloves during engine start, takeoff, and landing.

6.1.2.3. Crewmembers will remove rings and scarves before performing aircrew duties.

6.1.3. Personnel will have the appropriate items of clothing in their possession when flying in Arctic and Antarctic regions. **EXCEPTION:** Not applicable to transoceanic flights or when staging or transiting Elmendorf AFB AK.

6.2. Personal Requirements.

6.2.1. Passport. Crewmembers will carry a valid military passport on all missions outside the CONUS.

EXCEPTION: Unit commanders may authorize newly assigned personnel who have applied for, but not yet received, a passport to act as crewmembers on missions scheduled to transit locations where a passport is not required.

6.2.2. Shot Record. Crewmembers must maintain worldwide shot requirements and carry their shot records on all missions outside the CONUS.

6.2.3. Driver's License. A valid state driver's license is required on each TDY where use of US government general purpose vehicles may be required. Crewmembers will contact the local airfield manager before driving on the flight line.

6.2.4. Identification Tags. Crewmembers will carry two identification tags on all flights.

6.2.5. FOD Hazards. Crewmembers will not wear wigs, hairpieces, rings, ornaments, or earrings in the aircraft or on the flight line.

EXCEPTION: Crewmembers may wear plain elastic hair fasteners and/or pins, clips, or barrettes providing they do not interfere with the wearing of headsets, or the donning of oxygen equipment. They will be accounted for before and after flight.

6.2.6. Helmets and Oxygen Masks. Crewmembers will carry a personal helmet under the following conditions:

- 6.2.6.1. Anytime parachutes are required to be carried by the mission directive.
- 6.2.6.2. Anytime flash-blindness devices are used (MIL-G and/or PLTZ goggles).
- 6.2.6.3. When required for wear of the aircrew chemical defense ensemble.
- 6.2.6.4. When using NVGs, ANVIS-9s are the minimum required for Pilot positions. Each crewmember must carry spare batteries for their own NVGs.

NOTE: All crewmembers will preflight their own NVGs in an NVG test lane or Hoffman 20/20 test unit before use. If carried, preflight NVG spares.

- 6.2.7. Flashlights. Each crewmember must carry an operable flashlight for night flights.
- 6.2.8. A reflective belt or suitable substitute will be worn on flight lines during hours of darkness or periods of reduced visibility.
- 6.2.9. Tool Kits. One Flight Engineer tool kit will be carried on all missions without a crew chief on board.

6.3. Pre-mission Actions.

- 6.3.1. Theater Indoctrination. IAW AFI 11-202V2, AMC Sup 1.
- 6.3.2. Review tasking, itinerary, and altitude reservation (ALTRV) requirements.
- 6.3.3. Review applicable OPOD, SPINS, Virtual Risk Assessment (VRA), Country Risk Assessment (CRA), and FLIP.
- 6.3.4. Review the FCG for areas of operation (to include classified portion). Obtain necessary diplomatic clearances where required.
- 6.3.5. Obtain required customs forms.
- 6.3.6. Obtain worldwide FLIPs and sufficient communications security (COMSEC) materials for the duration of the mission.
- 6.3.7. Ensure physiological training, annual physical, immunizations, and flight evaluations will remain current for all crewmembers throughout the TDY period.
- 6.3.8. Ensure visas have been received, if required.
- 6.3.9. Obtain terrain charts for unfamiliar destinations if available.
- 6.3.10. Compile sufficient spare forms, flight orders, etc. to cover the TDY period.
- 6.3.11. Coordinate with C2 agency to release available seats to the passenger terminal.
- 6.3.12. Consider and factor in foreseeable safety risks and risk mitigation factors in accordance with Operational Risk Management (ORM).

6.4. Aircrew Publications Requirements. PIC's will ensure the publications specified in [Table 6.1](#) are carried on all missions. These publications may be either individual crewmember's or contained in unit developed publications kits. "P" designates the publication is required to be carried in paper format. "D"

designates the publication may be carried in either paper or digital format. If publications are carried in a digital format, the unit will provide the media to view the digital publications. The unit may specify additional publications in their unit supplement to this instruction.

Table 6.1. Aircrew Publications.

Publication	Format
Technical Order (T.O.) 1C-5A-1	P (2 Copies)
T.O. 1C-5A-1-1	P
T.O. 1C-5A-1CL-1	P (2 Copies)
T.O. 1C-5A-1CL-2	P
T.O. 1C-5A-1CL-4	P* (3 Copies)
T.O. 1C-5A-1CL-5	P
T.O. 1C-5A-9	P*
T.O. 1C-5A-9CL-1	P*
T.O. 1C-5A-9-2	P*
AFI 11-2C-5V3	P
AFI 11-202V3	D
*Not required for missions/locals without loadmasters	

6.5. Airfield Review. Aircrews will consult the web-based airfield database maintained by HQ AMC/A36AS (Airfield Suitability Branch) and comply with the GDSS/GDSS2/ASRR for updates to airfield operability and weight bearing capability.

6.6. Aircrew Intelligence Briefing. Aircrews will receive an intelligence briefing that will emphasize terrorist, enemy, and friendly political and military development in the area in which they will be flying. Obtain timely intelligence updates prior to entering a specific area of operations (AOR). In theater, aircrews should receive intelligence updates on initial arrival at a forward operating location (FOL), or en route stop, and thereafter when significant developments occur. Report information of possible intelligence value to the local intelligence office as soon as practical to ensure timely dissemination of mission reports (MISREPs).

Section 6B—Predeparture

6.7. Integrated Management Tool (IMT) Account. Pilots will obtain an IMT account prior to operating on IFM-planned sorties. Download aircrew departure papers using the IMT account, at locations without an AMC C2 presence. For operational missions, ensure IMT account passwords are active prior to departing home station.

6.8. Flight Crew Information File (FCIF).

6.8.1. Crewmembers will review FCIF, Volume 1, before all missions or ground aircrew duties, and update the FCIF currency record with the latest FCIF item number, date, and crewmember's initials.

6.8.2. Crewmembers delinquent in FCIF review or joining a mission en route will receive an FCIF update from a primary aircrew member counterpart on the mission.

6.8.3. Crewmembers not assigned or attached to the unit operating a mission will certify FCIF review by entering the last FCIF number and their initials behind their name on the file copy of the flight authorization or file copy of their crew orders.

6.9. Flight Crew Bulletins (FCB). Items in the FCB may include local procedures and policies concerning equipment and personnel generally not found in any other publications.

6.10. Mission Kits. Carry mission kits on all operational missions. Suggested items include:

NOTE: * Indicates mandatory for all missions away from home station.

6.10.1. Publications:

6.10.1.1. *AFI 11-401, *Aviation Management*

6.10.1.2. * DESC-I-31, *Purchase of Aviation Fuel and Services at Commercial Locations.*

6.10.1.3. DELETED

6.10.1.4. *AMCI 11-208, *Tanker/Airlift Operations.*

6.10.1.5. *Airfield Suitability and Restrictions Report (ASRR)

6.10.1.6. *AMC Aircrew Border Clearance Guide.

6.10.1.7. AMC Handbook 11-214, *AMC Aircrew Hazardous Materials Handbook.*

6.10.1.8. *Flight Crew Bulletin (FCB)

6.10.1.9. AFI 11-289, *Phoenix Banner, Silver, Copper Operations.*

6.10.1.10. Integrated Flight Management (IFM) Aircrew Flimsy

6.10.1.11. AMCPAM 11-2, *C-5 Fuel Planning.*

6.10.2. Forms:

6.10.2.1. DD 1351-2, **Travel Voucher or Sub voucher.**

6.10.2.2. DD 1351-2c, **Travel Voucher or Sub voucher (Continuation Sheet).**

6.10.2.3. *CBP Form 6059B, **US Customs and Border Protection Declaration Form.**

6.10.2.4. *DD 1854, **US Customs Accompanied Baggage Declaration.**

6.10.2.5. *DD 2131, **Passenger Manifest**

6.10.2.6. *CF 7507, **General Declaration (Outward/Inward)**

6.10.2.7. *AF IMT 15, **United States Air Force Invoice.**

6.10.2.8. *AF IMT 315, **United States Air Force AvFuels Invoice.**

6.10.2.9. AF IMT 457, **USAF Hazard Report.**

6.10.2.10. *AF IMT 651, **Hazardous Air Traffic Report (HATR).**

6.10.2.11. *AFTO IMT 781, **ARMS Aircrew/Mission Flight Data Document**

- 6.10.2.12. *AF IMT 1297, **Temporary Issue Receipt**
- 6.10.2.13. *AF IMT 2282, **Statement of Adverse Effect-Use of Government Facilities**
- 6.10.2.14. AF 664, **Aircraft Fuels Documentation Log**
- 6.10.2.15. AF 4052, **C-141/C-130/C-5/C-17 Refueling**
- 6.10.2.16. AF IMT 4053, **Pilot's INS Flight Plan and Log Computation**
- 6.10.2.17. *AF IMT 4054, **Performance and Fuel Management Log**
- 6.10.2.18. *AF IMT 4075, **Aircraft Load Data Worksheet**
- 6.10.2.19. *AF IMT 4097, **C-5 Aircraft Fatigue Tracking Worksheet**
- 6.10.2.20. *AF IMT 4098, **C-5 TOLD Card Worksheet**
- 6.10.2.21. *AF IMT 4099, **C-5 Pilot's TOLD Card**
- 6.10.2.22. *AF IMT 4101, **Relay Logic Landing Gear Malfunctions**
- 6.10.2.23. AF IMT 4115, **Flight Plan and Record**
- 6.10.2.24. *AMC IMT 41, **Flight Authorization** (or as MAJCOM prescribed) and include AF 1631, **NATO Travel Orders** (when required).
- 6.10.2.25. *AMC IMT 43, **AMC Transient Aircrew Comments.**
- 6.10.2.26. *AMC IMT 54, **Aircraft Commander's Report on Services/Facilities**
- 6.10.2.27. AF 72, **Air Report (AIREP)**
- 6.10.2.28. *AMC IMT 97, **AMC In-Flight Emergency and Unusual Occurrence Worksheet**
- 6.10.2.29. *AMC IMT 196, **Aircraft Commander's Report on Crewmember**
- 6.10.2.30. DELETED
- 6.10.2.31. AF IMT 711B, **USAF Mishap Report.**
- 6.10.2.32. *AF IMT 4031, **Crew Resource Management (CRM) Assessment Sheet.**
- 6.10.2.33. HMS Customs Declaration.
- 6.10.2.34. Japanese Customs Declaration.
- 6.10.2.35. *SF 44, **Purchase Order-Invoice-Voucher.**

6.10.3. Orders:

- 6.10.3.1. DD Form 1610, **Request and Authorization for TDY Travel of DoD Personnel.**
- 6.10.3.2. AF IMT 1631, **NATO Travel Orders (when required).**
- 6.10.3.3. *AF IMT 4327a, Crew **Flight (FA) Authorization** (or MAJCOM prescribed according to AFI 11-401, *Flight Management*).

6.10.4. Miscellaneous:

- 6.10.4.1. *Box car seals.
- 6.10.4.2. *Masking tape.

6.10.4.3. Pad lock and key.

6.11. Route Navigation Kits.

6.11.1. A route navigation kit is issued at home station and remains with the aircraft until return. Kits contain sufficient quantities of material to cover the planned mission and global operations as required.

6.11.2. The minimum contents of route navigation kits are in [Table 6.2](#).

6.11.3. On local unit training sorties, local area navigation kits may be used in lieu of route navigation kits in [Table 6.2](#). Contents of these kits will be determined by the unit.

Table 6.2. Route Navigation Kit Contents

Item	Number
FLIP Planning (Sections GP, AP/1, AP/1A, AP/1B, AP/2, AP/3, AP/4,)	1
FLIP IFR Supplement	2
FLIP Flight Information Handbook	2
FLIP En Route (High and Low)	2
FLIP Instrument Approach Procedures (High and Low)	3
Standard Instrument Departures (SID) (East and West US volumes 1 and 2)	3
Instrument Departures Europe and North Africa (High and Low)	3
Standard Terminal Arrival Routes (STARs)	3
OPREP-3 Report Format	1
Topographical and Sectional Charts for areas of operation (GNC/OPC/TPC/JNC/JOG/Sectionals)	As required
FLIP VFR Supplement	1
DoD Area Arrival Charts	(2) If available

6.12. Briefing Requirements.

6.12.1. Pre-departure Briefing Items. The PIC will contact the local C2 agency to confirm mission requirements. The PIC and controlling agency jointly share responsibility to identify special briefing requirements. Briefings may include buffer zone, electronic warfare activities, SAFE PASSAGE, Electromagnetic Interference (EMI), diplomatic clearance, hazardous cargo, anti-hijacking procedures, operations and safety supplements to flight manuals, and OPOD procedures.

6.12.2. Pilot in Command Briefing. Cover all applicable items of the operations briefing, including MAJCOM, NAF, and unit special interest items (SIIs). Brief crewmembers on the specific mission details if not previously accomplished. Use a MAJCOM approved briefing guide.

6.12.3. Specialized Briefing. Use specialized briefings to detail operating procedures or SIIs peculiar to various crew positions, and to answer questions relating to those specialties. Specialized briefings review tactics and procedures, AR information, NVG procedures, and technical instructions for specialized equipment operations. All crewmembers should attend each briefing. Crewmembers may only be excused from specialized briefings for pre-flight duties, however the PIC will back brief all appropriate items. Use a MAJCOM approved specialized briefing guide.

6.12.4. Weather Briefings. The PIC will obtain a briefing on current weather, trends, and forecast for the proposed route, destination, and alternates. The PIC will brief primary crewmembers on appropriate weather conditions before departure.

6.12.4.1. Aircrews flying flight-managed sorties/missions will use the weather briefing provided with the IFM aircrew departure papers. Local weather flights/agencies may update local takeoff weather data, but aircrews, working through their flight manager/dispatcher, will use 618 TACC weather operations (or the Operational Weather Squadron (OWS) supporting the theater AMOCC) as the final arbiter for weather-related issues and further updates.

6.12.4.2. On sorties not planned by a flight manager, crews should obtain weather information from their local weather flight or the OWS responsible for weather support at their location.

6.12.4.3. If adequate services are not available, and the crew cannot contact their home weather flight, OWS, or 618 TACC weather operations, obtain weather through any means available prior to mission accomplishment.

6.12.4.4. Weather information is permitted from US Military weather services, any FAA-approved weather source, or any host nation civil or military weather source.

6.12.4.5. Verbal weather briefings are authorized for local flights. Face-to-face briefings are not required.

6.12.5. Buffer Zone. Prior to operating an aircraft within or adjacent to an established buffer zone, the PIC will ensure primary crewmembers are briefed on current buffer zone procedures outlined in appropriate directives.

6.12.6. Peacetime and Wartime SAFE PASSAGE Procedures. Pilots must be familiar with peacetime and wartime safe passage of friendly military aircraft.

6.12.7. IFM Briefing. PICs will thoroughly review the aircrew departure papers provided for IFM sorties. When time and circumstances permit, the PIC, or designated representative, will contact the flight manager before signing the flight plan.

6.13. Call Signs.

6.13.1. Training Missions. Use the unit static call sign prefix followed by a 2-digit suffix assigned by the parent unit.

6.13.2. Operational Missions. Use call signs assigned by OPORD, FRAG, or diplomatic clearance. If no call sign has been assigned, use unit static call signs. When flying AMC channel missions, and no other call sign has been assigned, use the REACH call sign followed by the last digit of the year the aircraft was built and the last 3 digits of the aircraft tail number (or as required by diplomatic clearance). To complete flight plans, put the letters "RCH" followed by the last digit of the year the aircraft was built and the last 3 digits of the aircraft tail number.

6.13.3. The Reach 01 and 18 call signs are reserved for the AMC/CC and 18 AF/CC.

6.13.4. Aeromedical Evacuation (AE). For actual AE missions, use the call sign "Evac" followed by the five-digit aircraft number (example, Evac 12345) or mission designator. Refer to FLIP GP Chapter 4. When the AE portion of the mission is completed, normal call signs will be used. This does not alleviate the responsibility to use diplomatically cleared call signs when required.

6.14. Instrument Flight Rules. Conduct flight operations under IFR to the maximum extent possible without unacceptable mission degradation IAW AFI 11-202V3.

6.15. Flight Plan/Data Verification.

6.15.1. Computer Flight Plan (CFP) Use. CFPs are the official sources of performance, navigation, and climatic data, including en route wind information. If stand-alone computer based plans are used, each mission segment should use best wind data available. Use only MAJCOM validated CFPs.

6.15.1.1. Use CFPs to the maximum extent practical. Flight crews may manually compute flight plans. The PIC has final responsibility for flight plan accuracy and diplomatic clearance compliance.

6.15.1.2. Verify CFPs for route of flight and fuel computation accuracy before departure. Pass any flight plan discrepancies to the C2 flight planning office. On flight-managed sorties, promptly notify the flight manager of any flight plan discrepancies, to ensure the correct route of flight is filed with air traffic control. Identify inaccurate CFP winds to 618 TACC/XOCZF if the average wind for a route segment exceeds either 30 error in direction or 25 knots in speed.

6.15.2. All waypoint data retrieved from a database should be verified by one or more of the following methods:

6.15.2.1. Latitude/longitude from current FLIP.

6.15.2.2. Flight plan bearing/distance after latitude/longitude are verified for each waypoint.

6.15.2.3. Ground Based NAVAIDs.

6.15.3. Takeoff and Landing Data (TOLD) Restrictions and Procedures.

6.15.3.1. See paragraph [12.7.1](#) for TOLD verification procedures.

6.15.3.2. Landing Gross Weight Verification. The PIC will independently calculate landing gross weight and verify with the gross weight on the AF Form 4099. The PF will brief the landing gross weight during the approach briefing.

6.16. Departure Planning. Use AFI 11-202V3, AFMAN 11-217, this chapter, and the appropriate MAJCOM supplements. Regardless of the type of departure flown (IFR/VFR), review the following (as appropriate): IFR Departure Procedure, instrument approach plate, NOTAMS, GDSS Giant Report, and suitable terrain charts. At the earliest opportunity but NLT one hour prior to scheduled takeoff time, the PIC shall provide the engineer with a completed MAJCOM approved Departure Planning Worksheet (current version of worksheet located on AMC/A3V and Jeppsese websites). Complete all applicable sections of worksheet which must include as a minimum the following; SDP information, takeoff runway direction, length, slope, screen height (non-SDP), height and distance of any known obstacles affecting departure path (non-SDP), and finally, four engine climb gradient restrictions. The PIC may use the MAX

SDP weight, with applicable corrections applied, as a planning max weight to pass to C2 agencies for next mission leg.

6.16.1. VFR Departures.

NOTE: VFR departures will not be flown in lieu of obstacle clearance planning.

6.16.1.1. VFR departures are authorized when there is no authorized IFR departure method for the airport, when the aircraft cannot depart using one of the IFR departure methods contained in AFI 11-202V3 and AFMAN 11-217V1, when operational requirements dictate (i.e. tactical necessity), or when most of the mission is planned as a VFR flight for training. VFR departures require detailed planning to ensure obstacles and high terrain are avoided.

6.16.1.2. The minimum climb performance for VFR departures is determined by ensuring all the following conditions are met:

6.16.1.2.1. All-engine climb (AEO) capability ensures obstacle avoidance along the departure route.

6.16.1.2.2. One Engine Inoperative (OEI) climb capability shall ensure departure or emergency return route provides obstacle avoidance.

NOTE: If unable to comply with any of the above conditions, download cargo/fuel or delay until conditions that are more favorable exist.

6.16.1.3. Refer to FLIP for host nation VFR requirements before flying VFR outside of CONUS.

6.16.1.4. When departing VFR, maintain VFR cloud clearances until obtaining an IFR clearance or reaching the IFR MEA.

6.16.2. IFR Departures: Aircrews must use an approved IFR departure method as outlined in AFI 11-202V3 and AFMAN 11-217V1.

6.16.2.1. If the airport does not have an authorized IFR departure method, depart VFR IAW paragraph 6.16.1. An IFR departure is not authorized at airfields without an instrument approach.

6.16.2.2. IFR departures require detailed planning to ensure obstacles and high terrain are avoided. Adhere to screen height/departure end of runway (DER) requirements for IFR departure planning (AFMAN 11-217V1).

NOTE: Screen height requirements for departures depend on the agency that wrote the departure and/or the airfield where the departure is being flown. There is no standard or easy way for crews to determine screen height requirements. Therefore, when using departures other than those listed below, or when any doubt exists about which screen height to use, plan to cross the DER at 35 feet (minimum) unless you can ascertain a different screen height requirement from an appropriate authority.

6.16.2.2.1. Special Departure Procedure: Published on SDP.

6.16.2.2.2. USAF/USN produced SID or USAF/USN/USMC airfield: Zero feet.

6.16.2.2.3. US Army, FAA SID, and Joint Use Airfield within the US: 35 feet unless published.

6.16.2.2.4. NATO Countries (except US and Canada) Military Airports: 35 feet.

6.16.2.2.5. NATO Countries (except US and Canada) Civil Airports: 16 feet or as published.

6.16.2.2.6. Other ICAO nations: 16 feet or as published.

6.16.2.2.7. All others: 35 feet unless published.

6.16.2.3. Aircraft must meet the published climb gradient for the departure runway AEO. If no minimum climb gradient is published, 200 ft/nm will be used.

NOTE: In the event the aircraft is unable to meet the published ALL ENGINE climb gradient, download cargo/fuel or delay until more favorable conditions exist.

6.16.2.4. Use one of the following methods to ensure the aircraft can vertically clear all obstacles along the planned departure route with OEI:

6.16.2.4.1. Special Departure Procedure (SDP). SDPs are MDS-specific OEI escape procedures intended only for emergency use. They are applicable after the loss of an engine and, where available, will be used for engine-out departure planning. The goal is to provide SDPs for all departures. There are 100 constant surveillance airfields on the website. Additionally, SDPs can be obtained for most other airfields.

6.16.2.4.1.1. 'Ad hoc' requests. For fields not currently listed, ad hoc SDPs will be requested from Jeppesen via the website, e-mail (opsdata@jeppesen.com) or telephone. The process should be initiated during 618 TACC mission planning. Additionally, unit current operations and ultimately PICs will ensure SDPs are available for all scheduled airfields NLT 48 hours prior to departing home station. For en route mission changes and/or diverts, PIC will request ad hoc SDPs (if required) prior to entering crew rest. HQ AMC/A3V authorizes the use of Ad Hoc SDPs for a maximum of 7 days after the analysis date. The SDP analysis date is located in the upper left-hand corner of the takeoff performance sheet.

6.16.2.4.2. Minimum climb gradient. The TERPS standard minimum climb gradient is 200 ft/nm, which is based on the standard obstacle clearance surface (OCS) of 152 ft/nm plus the required obstacle clearance (ROC) of 48 ft/nm. If an SDP is not available, the crew must ensure compliance with any obstacle-based minimum climb gradients for the selected departure, with one-engine inoperative. Minimum climb gradients may be published as a 'Trouble T' restriction in the IFR Take-off Minimums section of FLIP or on a SID. When required for mission accomplishment, crews may subtract 48' /nm from published climb gradients before computing engine-out takeoff data. Minimum climb gradients do not take into account low, close-in obstacles (obstacles or terrain 200' AGL and below) which should normally be published as a NOTE on the SID or IFR departure procedure (Trouble T). Crews must also ensure the aircraft can vertically clear low close-in obstacles along the planned departure path.

NOTE: If the requirements of 6.16.2.4. cannot be met, download cargo/fuel or delay until more favorable conditions exist.

6.17. Weather Minimums for Takeoff use **Table 6.3.**

Table 6.3. Weather Minimums for Takeoff.

Mission	Visibility	Remarks
Operational	RVR 1000	When less than RVR 1600, but equal to or greater than RVR 1000, the crew may take off if mission priority dictates, provided the runway has dual RVR readouts and displays (minimum RVR 1000 on both) and runway centerline lighting is operational. For any takeoff below 1600 RVR, the crew must be fully qualified.
All others	RVR 1600	For runways with more than one operating RVR readout, RVR must read 1600 minimum on all.

NOTES:

1. If RVR readout is not available for the departure runway, visibility must be reported to be 1/2 mile (800 meters).
2. When weather is below approach and landing minimums (ceiling or visibility) a takeoff alternate is required (See paragraph 6.19.)
- 6.17.1. If no RVR readout is available for the departure runway, visibility must be reported to be 1/2 mile (800 meters).

6.18. Alternate Planning. Select alternate airports meeting the requirements of AFI 11-202V3. Choose alternates that best meet mission requirements and conserve fuel; they should not be within the same terminal area, if terminal forecasts are marginal. Select alternates that are not restricted by FLIP, FCG, or diplomatic clearances, and are compatible with the mission load and performance characteristics of the aircraft. The PIC retains final authority in the choice of alternates; however, selection by support agencies normally should be used if they meet the above criteria and the aircraft has already been serviced.

6.19. Departure Alternates.

6.19.1. A departure alternate is required if weather, including crosswinds, is below landing minimums for the available approach (at departure aerodrome). If planning an ILS approach, Category I minimums will be used.

6.19.2. Suitability of Departure Alternates. When a departure alternate is required, the aircraft must be capable of maintaining the MEA or minimum obstruction clearance altitude (MOCA), whichever is higher, to the alternate using OEI performance criteria. To qualify as a departure alternate, the airfield must meet one of the following conditions:

- 6.19.2.1. For an alternate within 30 minutes flying time, the existing weather must be equal to or better than the published approach minimums and forecast to remain so until 1 hour after takeoff, but in no case forecast to be lower than 200-1/2 (RVR 2400), or;
- 6.19.2.2. For an alternate within two hours flying time, the existing weather must be at least 500-1 above the lowest compatible published approach minimums, but not less than 600-2 for a precision approach or 800-2 for a non-precision approach, and forecast to remain so for 1 hour after ETA at the alternate.

6.20. Destination Requirements (*for filing purposes*). The forecast destination weather will be according to AFI 11-202V3 and the following:

6.20.1. File two alternates when:

6.20.1.1. The forecast visibility (intermittent or prevailing) is less than published for the available DoD or National Aeronautical Charting Office (NACO) precision approach.

6.20.1.2. The forecast ceiling OR visibility (intermittent or prevailing) is less than published for all other approaches. For approaches with no published ceiling requirement (for example Jeppesen approaches), the minimum required ceiling shall be computed by taking the published HAA or HAT and rounding it up to the nearest one hundred feet (or as determined by MAJCOM TERPs review). For example, a Jeppesen VOR approach with a published HAA of 642 feet would require a forecasted ceiling of 700 feet.

6.20.1.3. The forecast surface winds (intermittent or prevailing) exceed limits corrected for RCR.

6.20.2. File an alternate, regardless of forecast weather, when the departure or destination aerodrome is outside the CONUS. **EXCEPTION:** OCONUS, intra-theater flights that do not exceed 3-hours, comply with basic AFI 11-202V3.

6.20.3. A remote or island destination is defined as any aerodrome, which due to its unique geographic location, offers no suitable alternate (civil or military) within 2 hours flying time. The forecast weather at the remote or island destination must meet the following criteria:

6.20.3.1. The prevailing surface winds, corrected for RCR, must be within limits at ETA and forecast to remain so for 2 hours thereafter, and

6.20.3.2. The prevailing ceiling and visibility must be equal to or greater than published minimums for an available non-precision approach, for ETA plus 2 hours. However, if a precision approach is available, the ceiling or visibility may be intermittently below non-precision approach minimums (excluding ASR), but not below precision approach minimums (for ETA plus 2 hours).

NOTE: See [Chapter 14](#) for fuel planning considerations to a remote or island destination.

6.20.4. When filing to a destination where the alternate is located in Alaska or at latitudes greater than 59N, see [Chapter 14](#) for fuel planning considerations.

6.21. Adverse Weather.

6.21.1. Flight into areas of forecast or reported severe turbulence is prohibited.

6.21.1.1. Crews should confirm the type of aircraft the forecast turbulence applies to, or what type of aircraft reported the encounter, to gain a more accurate picture for their route of flight. The C-5 is a category II aircraft for turbulence. Turbulence category charts are found in Air Force Weather Agency technical note AFWA/TN 98/002, *Meteorological Techniques*.

6.21.1.2. The PIC is responsible for ensuring all passengers are seated, with seat belts fastened, when areas of moderate or greater turbulence are encountered or anticipated. **WARNING:** Serious injury may occur if passengers do not have their seat belts fastened and the aircraft encounters moderate or severe turbulence.

6.21.2. Flight into areas of forecast or reported severe icing is prohibited. Prolonged operation, such as cruise flight or holding, in areas of moderate icing should be avoided. **NOTE:** Air Force Weather

Agency technical note AFWA/TN 98/002, *Meteorological Techniques*, states that freezing drizzle is equivalent to moderate icing and freezing rain is equivalent to severe icing.

6.21.2.1. Do not takeoff under conditions of freezing rain or freezing drizzle.

6.21.2.2. Freezing precipitation, snow, freezing fog, or temperatures near 0C may cause ice or frost to accumulate on aircraft surfaces. When an aircraft requires de-icing/anti-icing prior to take-off, refer to the following:

6.21.2.2.1. Aircrews will only use de-ice and anti-ice fluids listed in their respective flight manual. Aircrews will be familiar with, and follow all restrictions in their associated flight manual with respect to anti-ice/de-ice procedures and holdover times.

6.21.2.2.2. MIL-A-8243 Type I and Type II de-icing fluids do not provide any anti-icing benefit, and therefore do not have holdover times. As a guide, for approved anti-icing fluids, crews may use published anti-icing holdover times IAW TO 42C-1-2, Aircraft Anti-icing Procedures, and AFFSA holdover tables located at the HQ AFFSA website. The holdover time begins when anti-icing fluid is first applied and the PIC shall use time, temperature, and dilution of mixture to determine when times are exceeded and re-apply fluid if required.

6.21.2.2.3. In all cases, PICs will ensure a visual inspection of the aircraft is completed within 5 minutes of departure. Inspect the top of the tail by running stabilizer trim full nose up with yoke full aft while viewing through the #1 escape hatch.

6.21.3. Do not fly directly above (within 2,000 feet) thunderstorms or cumulonimbus clouds. If unable to vertically clear thunderstorms or cumulonimbus clouds by at least 2000 feet, avoid them by at least:

6.21.3.1. 20 NMs at or above flight level FL 230.

6.21.3.2. 10 NMs below FL 230.

6.21.3.3. 5 NMs for tactical low-level operations below FL230 provided the outside air temperature is at or above 0C at flight altitude. Avoid gust fronts and winds preceding a rapidly moving thunderstorm.

CAUTION: Aircraft damage may occur 20NMs or more from any thunderstorms. Aircrews must familiarize themselves with information on thunderstorm development and hazards. Refer to AFH 11-203, *Weather for Aircrews*.

6.21.4. The use of ground-based radar as a means of thunderstorm avoidance should only be used to assist in departing an inadvertently penetrated area of significant weather. It should never be considered a normal avoidance procedure. When relying exclusively on ground-based radar for weather avoidance, and the ground controller is unable to provide avoidance instructions, attempt to maintain VMC by:

6.21.4.1. Changing routing.

6.21.4.2. Diverting to alternate.

6.21.4.3. Declaring an emergency and requesting priority assistance.

6.21.5. Aircrews should avoid flying in areas of recently dissipated thunderstorms and advected clouds (horizontal movement of clouds caused by wind) downwind of thunderstorms.

6.21.6. In order to minimize exposure to thunderstorm hazards when approaching or departing an airport in an area where thunderstorms are occurring or are forecast:

6.21.6.1. Attempt to maintain VMC.

6.21.6.2. Maintain at least 5NMs separation from heavy rain showers

6.21.6.3. Avoid areas of high lightning potential, i.e., clouds within plus or minus 5,000 feet of the freezing level or plus or minus 8C, of the freezing level.

NOTE: Approaches or departures may be accomplished when thunderstorms are within 10NMs providing they are not producing any hazardous conditions (such as hail, lightning, strong winds, gusts fronts, heavy rain, wind shear, or microburst) at the airport, and are not forecast or observed to be moving in the direction of the route of flight (to include the planned missed approach corridor, if applicable).

6.21.7. When performing approaches and landings at locations where temperatures are 0C or below, refer to the *Flight Information Handbook* (FIH) Section D, Temperature Correction Chart, to correct MDA, DH, and other altitudes inside the FAF.

6.21.8. Do not fly into an area of known or forecast moderate or greater mountain wave turbulence.

6.21.8.1. Mountain wave turbulence is normally a predictable condition. Military weather forecasters can advise crews of the potential for encountering mountain wave turbulence. However, weather data availability in mountainous regions and forecast model limitations prevent the prediction of all events. Crews must be familiar with the causes of mountain wave turbulence and the characteristic clouds that generally forewarn its presence.

6.21.9. Significant Meteorological Information (SIGMET). National Weather Service in-flight weather advisories are not limiting to Air Force aircraft. Contact the nearest military weather facility or flight service station for details, if applicable.

6.21.10. Volcanic Dust Precautions. Aircraft flight operations in areas of forecast or known volcanic activity or dust is prohibited. Plan all missions to avoid volcanic activity by at least 20 NMs.

6.21.11. Lightning Avoidance. The following conditions are most conducive to lightning strikes and prolonged flight in them should be avoided:

6.21.11.1. Within 8°C of freezing.

6.21.11.2. In clouds or in any intensity of precipitation or turbulence associated with thunderstorm activity.

6.22. Operational Risk Management (ORM). ORM is a logic based, common sense approach to making calculated decisions on human, material, and environmental factors before, during, and after all operations. USAF policy on ORM is contained in Air Force Policy Directive 90-9, *Operational Risk Management*. PICs will accomplish ORM worksheets IAW MAJCOM and local guidance as part of pre-flight activities. (See [paragraph 6.3.12.](#))

Section 6C—Preflight

6.23. AFTO Forms 781 Series.

6.23.1. Review AFTO Forms 781 series before applying power to the aircraft or operating aircraft systems. An exceptional release must be signed before flight. A maintenance officer, maintenance superintendent, or authorized civilian normally signs the exceptional release. If one of these individuals is not available, the PIC may sign the exceptional release. Ensure that the DD Form 1896, **Jet Fuel Identity Plate** and Air card is aboard the aircraft. Verify a current maintenance dash six inspection IAW T.Os. 00-20-1 & 1C-5A-6 is annotated on AFTO Form 781H, **Aerospace Vehicle Flight Status and Maintenance Document**. Refer to **paragraph 6.25.3.** for overdue inspections at locations without qualified maintenance personnel.

6.23.2. One-Time Flights. An aircraft may be released for a one-time flight with a condition that might be hazardous for continued use, provided the aircraft is airworthy for one flight to another station. Maintenance will refer to T.O. 00-20-1, *Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedures*, for downgrade authority and procedures. AFRC crews also see AFI 11202V3/AFRCSUP1. After the maintenance release is obtained, coordinate mission requirements with the controlling agency. The PIC's concurrence is required before the aircraft can be flown.

6.23.3. For Red X clearing procedures at stations without maintenance support refer to **paragraph 12.3.**

6.24. Aircraft Servicing and Ground Operations.

6.24.1. Aircraft Refueling. Aircrew members qualified in ground refueling may perform refueling duties. Flight engineers acting as refueling supervisors and panel operators will comply with T.O. 00-25-172. Aircrews will only refuel in cases when maintenance support is not readily available and the mission would be delayed. Crewmembers may augment maintenance refueling teams at en route stops. If required, the PIC will designate other crewmembers to assist the flight engineer.

6.24.2. Concurrent Servicing (CS) Operations. CS increases mission velocity by allowing ground servicing (Fuel, Defuel or LOX servicing) with or without passengers onboard concurrent with cargo loading and maintenance. If possible, refuel using right single point receptacles. Refer to **paragraph 12.4.2.** for specific CS fueling procedures.

6.24.2.1. The PIC and Chief Servicing Supervisor (CSS) shall ensure aircrew members and servicing personnel accomplish CS IAW T.O. 00-25-172 and current servicing technical orders/checklists. Current checklist procedures take precedence over T.O. 00-25-172 procedures.

6.24.2.2. When the aircrew is at the aircraft, the PIC is responsible for all aspects of aircraft operations and shall inform the CSS how aircrew members will participate in passenger evacuation/safety. In keeping with guidelines contained in T.O. 00-25-172, CSS has authority over all phases of CS operations to include personnel participating in the refuel.

6.24.2.3. Passenger Compartment Monitor (PCM). A current and qualified crew member shall continuously monitor passengers during CS (requires a PCM in each compartment with passengers). PCMs will not perform other duties during servicing. Passenger service representatives are not PCMs.

6.24.2.4. Communications. The PIC shall designate a current and qualified crew member to remain on the flight deck to monitor interphone and be prepared to broadcast a request for emergency assistance on a radio tuned to the appropriate agency with ready access to an emergency response team. PCMs shall monitor interphone and be prepared to evacuate passengers in an emergency.

6.24.2.5. Passenger briefing. A PCM shall brief passengers on emergency egress, exits, prohibitions, and hazards. Passengers will remain seated but will not wear seat belts during CS. When possible, the PCM should conduct the briefing prior to servicing. If servicing is in progress when passengers are boarding, the briefing will be given immediately after boarding.

6.24.2.6. Passenger boarding/exiting. When authorized, passengers may board or exit the aircraft for the express purpose of loading for departure or off-loading upon arrival. Passengers must board/exit on opposite side of servicing operations. Once onboard, except for emergencies, passengers shall not deplane while servicing operations are in-progress.

6.24.2.6.1. Grounding. Passengers are not required to ground themselves. Passengers shall remain outside the vapor hazard areas.

6.24.2.6.2. Passenger service representatives will assist the PCM when passengers board and exit. Passengers must remain outside the 50-foot fuel servicing safety zone (FSSZ), 20-foot LOX servicing area, and 25-feet from fuel vents during servicing.

6.24.2.7. Emergency Evacuation. The PIC, designated aircrew representative, or CSS will advise PCMs when to evacuate passengers if required.

6.24.2.8. Emergency exits. Unless environmental conditions dictate, the primary emergency exit will remain open and stairs/stands in place. If exits are not open due to inclement weather, configure exits for immediate egress.

6.24.2.9. Stairs/stands. Unless specifically waived, stairs are required for CS (AMC/A3 may waive stair requirement for C-5 aircraft with operational escape slides). The CSS and PCM will periodically check and reposition stairs that are out of place due to settling. A stair truck operator will remain at the aircraft to facilitate repositioning.

6.24.2.10. Compartment lighting. The PCM shall set interior lighting as bright as possible. *EXCEPTION:* Lights may be dimmed in a combat environment.

6.24.2.11. Prohibitions. Do not simultaneously service fuel and LOX or load/unload cargo containing explosives, oxygen, flammable gasses or liquids during CS. (See T.O. 00-25-172 for combat exception.)

6.24.2.12. Cargo loading. The primary loadmaster shall ensure cargo loading or unloading does not jeopardize passenger safety.

6.24.2.13. Emergency Exits/Stairs. Troop compartment: primary exit is #6 service door with large stairs. Alternate exits are #7L/R with small stairs, aft ramp with small stairs or drive-in (Do not stow troop ladder). Aft flight deck: primary exit with flight station ladder in place is crew entrance door. Primary exit with flight station ladder stowed is #5 service door with large stairs. Note: primary exits may be closed during inclement weather but must remain unlocked.

6.24.2.14. Movement into or within the safe area must be under control of the CSS. Crewmembers must properly ground themselves before boarding the aircraft or handling fuel servicing equipment.

6.24.3. Aircrew Dash One (-1) Preflight Inspection Requirements.

6.24.3.1. Change in calendar day at home station.

6.24.3.2. Aircraft ground time exceeds 48 hours away from home station (72 hours provided the aircraft is sealed, not flown, and documented entry control is maintained).

6.24.3.3. DELETED

6.24.3.4. When an aircrew assumes a -1 preflighted/thruflighted (as required) spare or quick turn aircraft conduct a thorough visual inspection is required. No additional -1 inspection is required.

6.24.4. Fire Protection and Crash Rescue.

6.24.4.1. The aircraft engine fire extinguisher system fulfills the minimum requirements for fire protection during engine start.

6.24.4.2. A fireguard is required for all engine starts including the APU. A crewmember or ground controller may act as fireguard.

6.24.5. Aircrew and maintenance engine run-ups.

6.24.5.1. Aircrew are authorized to perform engine runs when qualified maintenance personnel are not available. A mixture of aircrew and maintenance personnel is not recommended, if possible use all aircrew. When aircrew members are required to start or run up engines for maintenance purposes, the following procedures apply:

6.24.5.1.1. Maintenance personnel will accomplish all necessary inspections and preparations for the engine run. These actions include but are not limited to: intake/exhaust inspections, access panel security servicing, and AFTO Form 781 documentation.

6.24.5.1.2. Use only aircrew checklists. Begin with the "before starting engines" checklist and complete all appropriate checklists in their entirety through the "before leaving airplane" checklist.

6.24.5.1.2.1. Checklist deviations are authorized when maintenance requires less than four engines to be started.

6.24.5.1.3. Operate symmetrical engines when power settings above ground idle are required.

6.25. Aircraft Recovery Away from Main Operating Base (MOB). The PIC is responsible for ensuring the aircraft is turned to meet subsequent mission taskings. If qualified maintenance specialists are unavailable, the aircrew is responsible for turning the aircraft to meet subsequent mission taskings.

6.25.1. The PIC is responsible for the recovery items including:

6.25.1.1. Parking and receiving.

6.25.1.2. Aircraft servicing, including Aircraft Ground Equipment (AGE) usage.

6.25.1.3. Supervision of minor maintenance within local capability.

6.25.1.4. Minor configuration changes to meet mission tasking.

6.25.1.5. Securing the aircraft before entering crew rest.

6.25.1.6. Coordinating aircraft security requirements.

6.25.1.7. Documenting AFTO 781-series forms.

6.25.2. In all cases where aircrews must service the aircraft without qualified maintenance specialist assistance, comply with the appropriate maintenance T.O.

6.25.3. Aircrews are not qualified to accomplish the required ground inspections. In those instances where maintenance personnel are not available, the aircrew IAW T.O. 00-20-1 will enter a red dash symbol in the AFTO Form 781H, **Aerospace Vehicle Flight Status and Maintenance Document**, updating current status and enter a red dash symbol and a discrepancy that reflects that the applicable maintenance inspection (i.e. preflight, thru-flight, basic post-flight) is overdue.

6.25.3.1. The overdue inspection will be accomplished at the first location with qualified maintenance personnel provided adequate ground time is available.

6.26. Life Support Requirements.

6.26.1. The minimum quantity of oxygen aboard an aircraft before takeoff must be sufficient to accomplish the planned flight from the equal time point (ETP) to recovery should oxygen be required. Calculate using the 100 percent oxygen chart in the flight manual.

6.26.2. All aircrews shall comply with AFI 11-202V3, Table 6.1. When movement about the aircraft is necessary for relief, crew duties, etc., comply with the "cabin/cargo area crew" column. An authorized walk-around bottle satisfies the requirement.

6.26.3. Crewmembers occupying a crew station will have an oxygen mask readily available for use prior to engine start until engine shutdown.

6.26.4. PICs should conduct a rapid decompression drill during the first suitable segment of each air-lift mission. In addition to donning oxygen masks, each crew position should review procedures to be accomplished in the event of an actual rapid decompression.

6.27. Fleet Service. Ensure the required fleet service items are aboard the aircraft early enough to permit inventory prior to engine start.

6.28. Cargo Documentation. Proper cargo or mail documentation will accompany each load.

6.28.1. Load Data Information (Applicable to AFRC/ANG completing 618 TACC-directed mission). At stations where there is no mobility air transportation function, the aircrew will collect the required load information on each leg, and submit it to the first station, which has such a function. The report will be submitted on AF IMT 4075, *Aircraft Load Data Worksheet*.

6.29. Procedures for Airlifting Hazardous Cargo.

NOTE: Installed flares do not constitute hazardous cargo. However, any additional loads of flares are not considered aircraft equipment and shall be properly packaged and prepared IAW AFMAN 24-204.

6.29.1. The term "hazardous cargo" as used in conjunction with airlift operations, applies to the following classes and types of materials covered by AFMAN 24-204, *Preparing Hazardous Materials for Military Air Shipment*, and contains detailed instructions on packaging, marking, labeling, and certification requirements associated with the airlift of hazardous materials. Hazardous materials/cargo not properly packaged and documented in accordance with AFMAN 24-204 will be rejected for air shipment.

6.29.2. Briefing Requirements. As a minimum, the PIC and/or designated crewmember must be briefed at the base of departure concerning onboard hazardous materials, including the following information: (Nuclear weapons, nuclear components, and inert devices are covered in AFI 11-299.)

6.29.2.1. Proper shipping name (PSN), Hazard Class or Division and United Nations (UN), North America (NA), or Identification (ID) number.

6.29.2.2. Quantity of each hazard class by gross weight.

6.29.2.3. DoD class or division when any type explosives are involved.

6.29.2.4. The Net explosives weight (NEW) for Division 1.1 through 1.3 explosives.

6.29.2.5. Total net quantity of any toxic chemical ammunition or highly toxic substances.

6.29.2.6. Location on aircraft.

6.29.2.7. Passenger restrictions.

6.29.2.8. Special requirements, i.e., couriers, escort team, protective equipment, etc.

6.29.2.9. Cargo being carried under DOT exemptions, or other approvals/waivers.

6.29.2.10. Written notification indicating "prior permission required" (PPR), obtained from the next base to be transited.

6.29.2.11. Isolated parking and taxiing requirements.

6.29.2.12. Security classification, if appropriate.

6.29.2.13. Notification of the requirement to contact the next base to be transited at least 30 minutes prior to landing

6.29.2.14. Placard requirements.

6.29.2.15. Other special handling requirements.

6.29.3. Cargo documentation and loading procedures.

6.29.3.1. The loadmaster will ensure proper documentation, certification and identification of cargo is furnished. AFMAN 24-204 contains detailed instructions on packaging, marking, labeling, and certification requirements associated with the airlift of hazardous materials.

6.29.3.2. Hazardous materials/cargo falls into many categories and the utmost precautions must be observed when handling or transporting these items. Load all hazardous material to permit easy access in-flight without moving other cargo. Load jettisonable hazardous material to facilitate jettisoning. Adhere to the following appropriate safety precautions when loading hazardous cargo as appropriate:

6.29.3.2.1. Ventilate the aircraft.

6.29.3.2.2. Placard the aircraft.

6.29.3.2.3. Fire extinguishers must be available.

6.29.3.2.4. Thoroughly inspect the cargo.

6.29.3.2.5. Stow cargo away from heater outlets.

6.29.3.2.6. Notify medical personnel in case of damage to radioactive materials.

6.29.3.2.7. Use protective clothing and equipment.

6.29.4. Flight Planning.

6.29.4.1. Enter "Hazardous Cargo" in the remarks section of DD Form 175, or other information section of DD Form 1801, when any amount of the following is transported:

6.29.4.1.1. Division 1.1 through 1.3 explosives.

6.29.4.1.2. Division 1.4 explosives which transit United Kingdom or Italy.

6.29.4.1.3. Toxic chemical ammunition (Compatibility Group K).

6.29.4.1.4. Highly toxic substances.

6.29.4.1.5. Division 6.2 infectious substances which require technical escorts and/or special protective equipment.

6.29.4.1.6. Nuclear weapons.

6.29.4.1.7. Class 7 Radioactive Material (Yellow III label).

6.29.4.1.8. All other hazardous materials, except Class 9 and ORM-D when aggregate gross weight exceeds 1,000 pounds (454 kgs).

6.29.4.2. Border Clearance and Diplomatic (DIP) Clearances. Aircrews are required to check the Foreign Clearance Guide (FCG) for DIP Clearance requirements prior to departure on international flights transporting Hazardous Materials. If DIP Clearance is required the crew will verify that clearance has been granted prior to departure.

6.29.5. Departure/Arrival Notifications.

6.29.5.1. Prepare a departure message at stations when a C2 center is not available. The remarks section of the departure message will include: Class of hazardous material, DoD class or division for explosives, net explosive weight (NEW), and gross weight. If required, request special handling (e.g., isolated parking, security, technical escort teams, etc.).

6.29.5.2. If estimated time en route (ETE) is less than 1 hour, or if other circumstances preclude timely message receipt at destination, notify the next destination of the ETA and information listed in paragraph [6.29.5.1](#). If available, C2 will relay required information to next destination.

6.29.5.3. At least 30 minutes prior to ETA, check with destination to verify that hazardous material notification information, if required, was received.

6.29.5.4. If not, unless specifically prohibited by the theater commander, FLIP, or FCG, contact the agency specified in FLIP/FCG, base operations dispatcher, control tower or approach control. If landing at a United States civil airport without a tower, provide information to the nearest FAA flight service station. Transmit the following information:

6.29.5.4.1. PSN.

6.29.5.4.2. Hazard class.

6.29.5.4.3. UN, NA, or ID number.

6.29.5.4.4. NEW for Class 1 (Explosives).

6.29.5.4.5. Net quantity of chemical ammunition and toxic substances.

6.29.5.4.6. Special handling requirements.

6.29.6. Aircraft Parking.

6.29.6.1. Parking of aircraft carrying hazardous materials is the responsibility of the host airfield.

6.29.6.2. The following is provided for information only:

6.29.6.2.1. Aircraft transporting Division 1.1 and 1.2 explosives, nuclear weapons, and Hazardous Materials requiring a SAAM, i.e., Toxic Chemical Ammunition, are normally parked at remote (Hot) spots.

6.29.6.2.2. Divisions 1.3/1.4 explosives may or may not require "HOT" spot parking depending on quantity of explosives.

6.29.6.2.3. Transit aircraft with explosives, when cargo is not handled, may be parked at isolated locations other than "HOT" spots.

6.29.6.2.4. Other hazardous materials normally do not require remote or isolated parking.

6.29.6.2.5. Military installations are responsible for proper placarding of aircraft. If non-DOD airfields are used, it may be necessary for the aircrew to placard aircraft. Placards resemble hazard labels.

6.29.7. Unscheduled Landing Due to In-flight Emergency. Transmit unclassified information to the appropriate ATC facility as follows:

6.29.7.1. Nature of emergency and intent to land.

6.29.7.2. Aircraft position and ETA.

6.29.7.3. Number of personnel and location in aircraft.

6.29.7.4. Fuel on board.

6.29.7.5. Hazardous materials aboard, location of the cargo, and information listed in paragraph **6.29.5.4.**

6.29.8. After Unscheduled Landing. Contact the appropriate C2 center by telephone, HF radio, or message, giving arrival notice, hazardous materials information, and other pertinent information, as required.

6.30. Handling of Classified Cargo, Registered Mail, Mission Capable (MICAP) Parts, Very, Very Important Part (VVIP), Forward Supply System (FSS) Shipments, and Courier Material.

6.30.1. MICAP, VVIP, sensitive cargo, courier materials, and registered mail moving within the normal airlift system are receipted at the on and offload stations using the air cargo manifest. For unit moves operated in accordance with Defense Transportation Regulation (DTR), Part III, Mobility, classified or sensitive cargo movement is normally manifested utilizing the DD Form 2130-2, or similar automated product, and will normally be accompanied by a unit courier. However, if classified/sensitive unit cargo is offered without an accompanying courier, the DD1907, **Signature and Tally Record**, must be used.

6.30.1.1. Defense Courier Service (DCS) couriers coordinating with the PIC are authorized to designate officer or enlisted, (E-5 and above) crewmembers on military aircraft as couriers to escort and safeguard courier material when other qualified personnel are not available. Qualified

passengers, if carried, are designated before designating crewmembers. The following restrictions apply:

6.30.1.1.1. Primary crewmembers will not be designated couriers without the consent of the PIC.

6.30.1.1.2. Crewmembers on aircraft scheduled to make an extended en route stop at a location where DCS couriers cannot provide en route support will not be designated as couriers.

6.30.2. During stops at en route locations supported by DCS stations, DCS couriers are required to meet designated couriers, guard and protect the material.

6.30.2.1. During unscheduled en route stops crewmembers may place courier material in temporary custody of the following agencies in descending order of priority.

6.30.2.1.1. DCS courier.

6.30.2.1.2. TOP SECRET control officer of the US armed forces.

6.30.2.1.3. US Department of State Diplomatic Courier.

6.30.2.1.4. US Department of State activity.

6.30.2.1.5. US military guards.

6.30.2.1.6. US DOD civilian guards.

6.30.3. If unable to follow the itinerary to the destination of the courier material, or material is lost, stolen or otherwise compromised, report circumstances to the nearest Defense Courier Station and notify the local US military commander or US Government activity.

6.30.4. Life or death urgency shipments consist of biological or other medical supplies of such urgency that human life is dependent upon immediate receipt. Shipments will be manifested separately and the manifest annotated with the words LIFE OR DEATH URGENCY. All shipments will be handled on a hand-to-hand receipt basis, using either the air cargo manifest or the DD1907, for unit moves. The PIC, or designated representative, will be briefed on the urgency of the shipment and be made the custodian during flight.

Section 6D—Departure

6.31. On Time Takeoffs. Mission departures are on time if the aircraft is airborne within -20/+14 minutes of scheduled takeoff time or as specified in a MAJCOM supplement.

6.31.1. Scheduled takeoff time may be adjusted to make good a time over target (TOT) or time of arrival (TOA). PICs shall notify C2 agency before takeoff to adjust the scheduled takeoff time.

6.31.2. Early Departures. Early departures are authorized to prevent a delay due to weather, ATC restrictions, airfield or aircraft operational limitations, to adjust mission flow during a large-scale operation, or if approved through C2 channels provided the impact on local and downrange facilities and crew duty is evaluated. When on a flight managed sortie, contact the flight manager with the early departure request at the earliest opportunity.

| 6.32. Not Used

Section 6E—Enroute

6.33. Flight Progress. In-flight, use all available navigational aids to monitor FMS performance. Immediately report malfunctions or any loss of navigation capability that degrades centerline accuracy to the controlling air route traffic control center (ARTCC). Use the following procedures for flight progress:

6.33.1. Before an oceanic flight, plot the oceanic portion on an appropriate chart. Annotate the chart with the mission number and date. If practical, chart may be reused.

6.33.2. Another pilot will verify waypoint data inserted into the INS/FMS. Check both the coordinate information and the distances between waypoints against the flight plan.

6.33.3. Obtain a coast out fix prior to, or immediately on entering the Category I Route or over-water segment. Perform a gross navigational error check using available NAVAIDS and annotate the position and time on the chart.

6.33.4. When approaching each waypoint on a Category I route, recheck coordinates for the next waypoint.

6.33.5. Approximately 10 minutes after passing each oceanic waypoint, record and plot the aircraft position and time on the chart, and ensure compliance with courses and ETA tolerances.

6.33.6. If a revised clearance is received, record and plot the new route of flight on the chart.

6.33.7. Upon return to home station, turn in the charts (copies if reused) and applicable computer flight plans to the squadron. Squadrons will retain the charts, computer flight plans, and associated materials for a minimum of 3 months.

6.33.8. Operations in International/Territorial Airspace. (See FLIP, FCG, and AP, for further guidance). US military aircraft and DoD personnel entering another nation to conduct US government business must have the approval of the foreign government concerned to enter their airspace. Foreign clearances for US international air operations are obtained through US officials known as Defense Attach Officers (DAOs).

6.33.8.1. There are essentially two types of airspace: international airspace and territorial airspace. International airspace includes all airspace seaward of coastal states' territorial seas. Military aircraft operate in such areas free of interference or control by the coastal state. Territorial airspace includes airspace above territorial seas, archipelagic waters, inland waters, and land territory, and is sovereign airspace. Overflight may be conducted in such areas only with the consent of the sovereign country.

6.33.8.2. Consistent with international law, the US recognizes sea claims up to 12NMs. Diplomatic constraints and/or a lack of diplomatic clearances usually result in missions operating in international airspace. Therefore, it is imperative sufficient information be provided far enough in advance to allow compliance with FCG requirements established by the countries concerned. The US does not normally recognize territorial claims beyond 12NMs; however, specific guidance from certain US authorities may establish limits, which differ from the standard.

6.33.8.3. Flight Information Region (FIR). An FIR is an area of airspace within which flight information and related services are provided. An FIR does not reflect international borders or sovereign airspace. Aircraft may operate within an established FIR without approval of the adjacent country, provided the AC avoids flight in territorial airspace.

6.33.8.4. Aircrews on a flight plan route, which takes them from international airspace into territorial airspace, for which approved aircraft clearances were obtained, should not amend entry point(s).

6.33.8.5. Violations of foreign sovereignty result from unauthorized or improper entry or departure of aircraft. Aircrews should not enter into territorial airspace for which a clearance has not been duly requested and granted through diplomatic channels.

6.33.8.6. ATC agencies are not vested with authority to grant diplomatic clearances for penetration of sovereign airspace where prior clearance is required from the respective country. Aircraft clearances are obtained through diplomatic channels only.

6.33.8.7. In the event an ATC agency challenges the validity of a flight routing or attempts to negate existing clearances, ACs must evaluate the circumstances. The normal response will be to attempt to advise the ATC agency that the aircraft will continue to planned destination, as cleared in international airspace. The key phrase is "in international airspace." Safety of flight is paramount in determining mission continuation. Under no circumstances should aircrews construe a clearance, which routes their mission over sovereign airspace, which was not approved through diplomatic channels before mission departure, as being valid authorization.

6.33.8.8. Aircrews operating missions requiring unique or specially developed routing will normally be briefed at home station, onload station, and/or by the last C2 facility transited before performing the critical portion of the mission.

6.33.8.9. Aircrews (except on weather reconnaissance missions) normally are not tasked to and should not fly "due regard" routings unless coordinated with the appropriate MAJCOM C2 and specifically directed in the mission FRAG. The "due regard" or "operational" option obligates the military PIC to be their own ATC agency to separate their aircraft from all other air traffic. If operational requirements dictate, PICs may exercise the "due regard" option to protect their aircraft. Aircraft will return to normal air traffic services as soon as practical.

6.34. Navigational Aid Capability. The following airspace categories are each defined in FLIP, and are considered special qualification airspace: MNPS, RVSM, RNP, and BRNAV.

NOTE: Airspace and associated navigational aid equipment capability are rapidly evolving. Pilots must maintain an in depth knowledge of current FLIP requirements/policies.

6.34.1. Should any required equipment fail before entering such airspace, request a new clearance to avoid this airspace.

6.34.2. Should any required equipment fail after entry into such airspace, immediately notify ATC and coordinate a plan of action.

6.34.3. Document (in the aircraft forms) malfunctions or failures of required equipment, including the failure of this equipment to meet tolerances.

6.34.4. Required Navigation Performance (RNP) Airspace. C-5 aircraft (FMS-800 and AMP) are approved in RNP airspace without time limitations. The C-5 AMP defaults to RNP-4 for en route operations. If operating in less stringent airspace (e.g. RNP-10 or RNP-5 airspace), crews should manually set the RNP value to the appropriate value if they receive an UNABLE RNP CWA caution. If the UNABLE RNP CWA is still present after manually changing the RNP value, the aircraft does not meet the navigation accuracy requirements of the current airspace and ATC should be notified.

6.34.4.1. Preflight Procedures. Review maintenance logs to ascertain status of RNP equipment.

6.34.4.2. En route. Before entering Oceanic Airspace, the aircraft position should be checked as accurately as possible by using external navigation aids (coast-out fix). Periodic crosschecks will be accomplished to identify navigation errors and prevent inadvertent deviation from ATC cleared routes. Advise ATC of the deterioration or failure of navigation equipment below navigation performance requirements and coordinate appropriate actions.

6.34.4.3. Document (in the aircraft forms) malfunctions or failures of RNP required equipment, including the failure of this equipment to meet RNP tolerances.

6.34.5. Basic Area Navigation (BRNAV) Airspace. BRNAV navigation accuracy criteria is RNP-5. C-5 aircraft (FMS-800 and AMP) are approved for BRNAV operations with no restrictions.

6.34.6. Reduced Vertical Separation Minimum (RVSM) Airspace. Airspace where RVSM is applied is considered special qualification airspace. Both the operator and the specific aircraft type must be approved for operations in these areas. Both FMS-800 and AMP airplanes are certified for RVSM operations. Pilots will refer to FLIP AP/2 and the following for RVSM requirements:

6.34.6.1. Both primary altimeters, the autopilot, the altitude advisory system, and the transponder, must be fully operational. The PIC will request a new clearance to avoid this airspace should any of this equipment fail.

6.34.6.2. Engage the autopilot during level cruise, except when circumstances such as the need to re-trim the aircraft or turbulence require disengagement.

6.34.6.3. Crosscheck the altimeters before or immediately upon coast out. Record readings of both altimeters.

6.34.6.4. Continuously crosscheck the primary altimeters to ensure they agree 200 feet.

6.34.6.5. Limit climb and descent rates to 1,000 feet per minute when operating near other aircraft to reduce potential TCAS advisories.

6.34.6.6. Immediately notify ATC if any of the required equipment fails after entry into RVSM airspace and coordinate a plan of action.

6.34.6.7. Document in the aircraft forms malfunctions or failures of RVSM required equipment.

6.35. CIRVIS and Other Reports. Report all vital intelligence sightings from aircraft as indicated in FLIP planning or FLIP En route Supplement.

6.35.1. In-flight harassment or hostile action against aircraft. Aircraft subjected to harassment or hostile action by foreign aircraft will immediately contact the nearest USAF air and ground voice facility and report the encounter. Include aircraft nationality, type, insignia, or any other identifying features; note position, heading, time, speed when harassed, and the type of harassment. Request relay of the report to the nearest C2 agency. Also, attempt to contact the nearest command post when in UHF and VHF range.

6.35.2. Other incidents will be reported as indicated in JCS Pub 6V5 and AFMAN10-206, *Operational Reporting*.

6.36. In-Flight Meals. Pilots should not eat meals at the same time, and their meals should consist of different menu items.

6.37. Communications.

6.37.1. Crews should conduct an HF radio ground check before takeoff if use of the HF radio may be required for ATC or C2 communications. Attempt to establish HF contact before going out of UHF/VHF range. If unable to establish HF contact with the controlling HF station, and an alternate means of relay of ATC information is not available, the pilot should return to the nearest suitable support base.

6.37.2. Pilots shall provide ARTCC position and weather observations when required. If unable to contact an ATC agency, he should attempt to relay through the GLOBAL HF stations.

6.38. In-flight Emergency Procedures. The PIC shall report deviations from directives that may occur as a result of an emergency according to AFI 11-202V3. Time and conditions permitting, inform passengers of the situation and intentions.

6.38.1. Notification of Controlling Agencies. When practical after completing the aircraft emergency action checklists and associated actions, crews should furnish the controlling agency and appropriate C2 agencies with a description of the difficulty, assistance required, intentions, and any other pertinent information.

6.38.2. The PIC may initiate a CONFERENCE HOTEL/SKYHOOK when additional expertise is necessary. Communications procedures are as follow:

6.38.2.1. Local Area. When in UHF or VHF range, initiate the conference over appropriate frequencies.

6.38.2.2. En route. Attempt to establish a phone patch with the nearest or controlling C2 Center using global HF network, UHF/VHF stations, SATCOM, etc. If unable, aircrews are permitted to use ARINC radio service as an additional avenue for phone patch connectivity.

6.38.2.3. Provide the following information when time permits.

6.38.2.3.1. Narrative description of the situation to include actions taken by the crew and the intentions of the PIC.

6.38.2.3.2. What assistance is being requested.

6.38.2.3.3. Fuel on board and hours of endurance.

6.38.2.3.4. Position.

6.38.2.3.5. Altitude and flight conditions.

6.38.2.3.6. Type cargo, number of personnel and distinguished visitors (DV) on board.

6.38.2.3.7. Qualification of PIC.

6.38.2.3.8. Planned landing base.

6.38.2.3.9. ETA at landing base.

6.38.3. NVG Emergency Procedures.

6.38.3.1. NVG Inadvertent Weather Penetration Procedures. Undetected meteorological conditions represent one of the most dangerous conditions facing a crew using NVGs. The onset of scintillation (a loss of scene detail), or changes in the appearance of halos, represent the best clues to the possibility of inadvertent weather penetration. If IMC is encountered, cease NVG use until VMC can be attained.

6.38.3.2. NVG Failure. If the PF's NVGs fail after touchdown, transfer control to the PM for the landing rollout. Use normal lights for illumination until both pilots are ready to resume NVG operations.

6.39. Need for Medical Assistance. When a person aboard the aircraft requires medical care, the PIC will notify the station of intended landing in sufficient time so the aircraft may be met by medical personnel. Notification will include the patient's sex, approximate age, and major complaint.

6.40. Weather Forecasts. It is the pilot's responsibility to obtain destination weather prior to descent. The primary sources are 618 TACC weather operations, OWSs, and USAF weather flights via pilot-to-meteorologist service (PMSV) or through a USAF aeronautical station. For aircraft flying in EUCOM AOR (ENAME operations) contact USAFE/OWS at Sembach AB GE. SOUTHCOM AOR contact 25 OWS at Davis-Monthan AFB, AZ. The ATC system can provide weather information to enroute aircraft.

Section 6F—Arrival

6.41. Descent. Before descent into unfamiliar areas, review appropriate terrain charts to increase aircrew situational awareness of obstructions. Primary crewmembers will not be involved in duties other than aircraft operations, descent and approach monitoring, and required checklist items from the initial descent point to landing.

6.41.1. Night and Marginal Weather Operations. Fly a precision approach, if available, at night or during marginal weather. If a precision approach is not available, fly any available approved instrument approach.

6.41.1.1. A visual approach may be flown during night VFR conditions if an approved instrument approach to the landing runway is not available or operational missions require a tactical approach. **NOTE:** A visual glide slope indicator, VASI, PAPI, etc., is required. (N/A for NVG operations).

6.41.1.2. On training/evaluation flights, pilots may fly non-precision approaches or VFR traffic patterns to accomplish required training and evaluations. The pilot not flying will monitor a precision approach when practical to enhance safety.

6.41.1.3. For recovery at home station, pilots may elect to fly a visual or non-precision approach, if weather minimums permit.

6.42. Instrument Approach Procedures.

6.42.1. Instrument approach RVR/visibility and, if required, ceiling minimums will be as published for a category "D" aircraft. If approach speeds exceed 165 knots, the minimums for category "E" will be used.

6.42.2. Prior to starting an instrument approach, pilots will confirm their aircraft can comply with the missed approach climb gradient requirements established in AFI 11-202V3.

6.42.3. Weather minimums. Before starting an instrument approach, or beginning an en route descent, pilots will confirm the existing weather is reported to be:

6.42.3.1. At or above required visibility for straight-in or sidestep approaches.

6.42.3.1.1. For PAR approaches, visibility will be no lower than RVR 2400 (730 meters) or 1/2 mile visibility (800 meters) with no RVR readout available.

6.42.3.2. At or above required ceiling and visibility for circling approaches.

6.42.3.2.1. For circling approaches with no published ceiling requirement, the required ceiling shall be computed by taking the published HAA plus 100 feet rounded up to the next one hundred foot value. (For example, if the HAA is 747 feet, add 100 feet to get 847 feet and then round up to the next one hundred foot value which would be 900 feet. Your ceiling for the approach must be at or above 900 feet.) When circling minimums are published, but not by category, circling approach minimums will be as published, but in no case lower than 600 feet and 2 miles visibility.

6.42.3.3. Increase the published visibility minimums of an instrument approach by ½ SM or as noted in NOTAMs, on ATIS, or on the approach plate, when the runway approach lighting system (ALS) is inoperative. (This applies only to the ALS itself, not to VASIs, PAPIs, and other lights that are not a component of the ALS.)

6.42.3.4. If the ceiling is below the value depicted for published DoD or NACO precision approach, but visibility is at or above authorized minimums, comply with fuel requirements before initiating en route descent, penetration, or approach.

6.42.4. Not used.

6.42.5. Category I ILS Procedures. Decision height for precision approaches will be as published, but no lower than 200 feet height above touchdown (HAT).

6.42.5.1. ILS Precision Runway Monitor (PRM) Approaches. Both pilots must be certified to conduct an ILS PRM approach. Refer to AFI 11-2C5V1 for certification procedures. Comply with the following operational procedures:

6.42.5.1.1. Two operational VHF communication radios are required.

6.42.5.1.2. The approach must be briefed as an ILS/PRM approach.

6.42.5.1.3. If unable to accept an ILS PRM approach clearance, contact the FAA ATCSCC at 1-800-333-4286 prior to departure time to obtain a pre-coordinated arrival time. Pilots who arrive at a PRM airport unable to accept PRM approach clearance, who did not contact ATC prior to departure, should expect an ATC directed divert to a non-PRM airport.

6.42.5.1.4. All breakouts from the approach shall be hand flown. Autopilots shall be disengaged when a breakout is directed.

6.42.5.1.5. Should a TCAS Resolution Advisory (RA) be received, the pilot shall immediately respond to the RA. If following an RA requires deviating from an ATC clearance, the pilot shall advise ATC as soon as practical. While following an RA, comply with the turn portion of the ATC breakout instruction unless the pilot determines safety to be a factor.

6.42.6. Category II ILS Procedures. DH is based on radar altitude. Use the lowest published radar altitude, but no lower than 100 feet HAT. Minimum RVR is 1200. Maximum crosswind limitation is 10 knots. Crosswind of 15 knots may be used for training approaches (requires weather of 200 – ½ or greater).

6.42.6.1. The following airfield and aircraft equipment must be operational (AFMAN 11-230, *Instrument Procedures*). *NOTE:* .

6.42.6.1.1. Approach lights.

6.42.6.1.2. Runway centerline lighting.

6.42.6.1.3. High intensity runway lights or touchdown zone lights.

6.42.6.1.4. Approach end transmissometer.

6.42.6.1.5. ILS far field monitor.

6.42.6.1.6. Sequenced flashers.

6.42.6.1.7. Both VHF NAV receivers.

6.42.6.1.8. Both radar altimeters

6.42.6.1.9. Autopilot and autoland sub-system (FMS-800 airplanes).

6.42.6.1.10. Autopilot (For AMP airplanes category II approaches must be performed with the DUAL mode FMA displayed and coupled to the autopilot).

6.42.6.2. Aircrews will not execute an actual Category II ILS to minimums unless both pilots are qualified and current in Category II ILS. The pilot must have logged at least 100 hours in command since C-5 AC qualification.

6.42.7. MLS Approaches. Conduct MLS approaches IAW AFI 11-202V3 and AFMAN 11-217.

6.42.8. NDB Procedures. NDB approaches may be flown during day, night, or IMC conditions after compliance with any airfield restrictions in GDSS/GDSS2/ASRR. Back up each approach with available nav aids/GPS to include loading the NDB coordinates in the FMS.

6.42.9. GPS and RNAV (GPS) Approach Procedures. Properly trained C-5 aircrews are permitted to fly RNAV and RNAV (GPS) approaches. RNAV and RNAV (GPS) approaches will be flown only to LNAV minima and IAW AFI 11-202V3.

6.42.9.1. GPS Overlay Approaches. May be flown IAW AFI 11-202V3.

6.42.9.2. Both FMS-800 and AMP experience difficulties in handling certain leg types contained in legacy (VOR, TACAN, NDB) approaches. Therefore, approaches with Procedure Turn (PI) legs are not contained in the FMS-800 database and should be displayed for situational awareness

only in AMP aircraft. Attempting to fly these approaches in LNAV may place the aircraft outside protected airspace.

6.42.9.3. FMS-800 aircraft require a predictive RAIM check IAW AFI 11-202V3 prior to initiating any database approach. AMP aircraft automatically perform a RAIM check for the FAF and MAP at 2 NM from the FAF. Additionally, approach capability is monitored by RNP. If the required RNP cannot be met an UNABLE RNP and NO APPR CWA is displayed.

6.42.10. After beginning an En Route Descent or Approach. IAW AFI 11-202V3 paragraph 8.13.2.2, after starting an en route descent or published approach and the weather is reported or observed to be below approach minimums, the PF has the option of continuing the approach to the missed approach point (MAP)/DH. If the approach is abandoned, level off (or descend if a lower altitude is required for the missed approach procedure). Comply with the last assigned clearance until a new or amended clearance is received. Do not continue a CAT II ILS if the weather is reported to be below CAT II minima.

6.42.10.1. Do not continue the approach below minimums unless the runway environment is in sight and the aircraft is in a position to make a safe landing.

6.42.10.2. If the approach is continued, sufficient fuel must be available to complete the approach and missed approach, and proceed to a suitable alternate with normal fuel reserve.

6.42.10.3. The PIC has final responsibility for determining when the destination is below designated minimums, and for initiating proper clearance request.

6.42.11. Holding. An aircraft may hold at a destination that is below landing minimums, but forecast to improve to or above minimums provided:

6.42.11.1. The aircraft has more fuel remaining than that required to fly to the alternate and hold for the appropriate holding time, and the weather at the alternate is forecast to remain at or above alternate filing minimums for the period, including the holding time.

6.42.11.2. Destination weather is forecast to be at or above minimums before excess fuel will be consumed.

6.43. NVG Weather Minimums. Weather minimums are IAW this instruction and AFI 11-202V3. Terminal weather required to conduct NVG airland operations: 1500 foot ceiling, 3 SM visibility for DR or visual approaches and the higher of 600 foot ceiling and 2 SM visibility or published minimums for instrument approaches.

NOTE: NVGs have inherent limitations which can further be reduced by poor weather conditions. Crews will consider weather conditions, moon illumination and position, sky glow at dawn and dusk, cultural lighting, and weapon/expendable effects when planning NVG operations.

6.44. Unscheduled Landings. When an unscheduled landing or crew rest occurs at a base without a passenger facility, the AC should immediately advise the appropriate C2 agency and request assistance in arranging substitute airlift for passengers on board. The following procedures apply when obtaining support for service members, in a group travel status, who are transported on AMC organic aircraft flying a Transportation Working Capital Fund (TWCF) mission, which incur an unscheduled delay due to weather or maintenance problems, forcing the members to be lodged at that location until the aircraft can continue its mission.

6.44.1. If the delay is at a location where DoD facilities and AMC TWCF funds are available, payment for lodging (contract or on-base) will be made by the local accounting liaison/OPLOC citing TWCF funds. The appropriate TWCF fund cite may be obtained from the local financial analysis and/or accounting liaison office. Normally, a BPA contract or AF Form 616 is already established at these locations to charge the routine lodging costs for transient or TDY individuals who are on TWCF funded travel orders.

6.44.2. If the delay is at a location where DoD facilities are available and AMC TWCF funds are not available, the AC will utilize AF IMT 15, **United States Air Force Invoice** authority to acquire the appropriate lodging accommodations. Upon return to home station, the PIC will send the AF IMT 15 to the local accounting liaison office. A copy of the service members' group travel orders, along with any other pertinent supporting data, must accompany the form (e.g., lodging invoice and/or receipts). When the AF IMT 15 has been validated, it will be forwarded on to the servicing OPLOC for payment, citing the funds of the unit whose aircraft was delayed.

6.44.3. If the delay is at a location where both DoD facilities and TWCF funds are unavailable, the PIC will use AF IMT 15 authority to acquire the appropriate meals, quarters, and transportation to support the service members. Upon return to home station, the PIC will send the AF IMT 15 to the local accounting liaison office. A copy of the service members' group travel orders, along with any other pertinent supporting data, must accompany the form (e.g., lodging invoice and/or receipts). When the AF IMT 15 has been validated, it will be forwarded on to the servicing OPLOC for payment, citing the funds of the unit whose aircraft was delayed.

NOTE: This policy does not apply to those passengers on delayed TWCF organic aircraft who are in a per diem or space available status, except for those duty passengers on TWCF funded travel orders delayed at locations where TWCF funds are available.

6.45. Maintenance. Complete the AFTO 781 after each flight. After landing, crewmembers debrief maintenance personnel on the condition of the aircraft, engines, avionics equipment, and all installed special equipment as required. At stations without maintenance support, when a maintenance requirement exists the PIC will ensure a thorough debrief is provided to the C2 agency. On AMC missions notify 618 TACC Logisites Control (618 TACC/XOCL).

6.46. Customs and Border Clearance.

6.46.1. Normal Operations.

6.46.1.1. The unit dispatching the mission is normally responsible for the border clearance of its aircraft.

6.46.1.2. When support is not available, border clearance is the responsibility of the PIC. Duties may be assigned to ground personnel or to the loadmaster, but the PIC retains ultimate responsibility. When a C-5 aircraft is on-loaded at a base without an air traffic function, the PIC is responsible for ensuring the following:

6.46.1.2.1. Crewmembers, troops, and passengers possess current passports and valid visas, when required.

6.46.1.2.2. Crewmembers, troops, and passengers have current certificates of immunization (shot record).

6.46.1.2.3. Cargo entry documents are in proper order.

6.46.1.2.4. Departing or entering the United States through a location where border clearance can be obtained.

6.46.1.2.5. Obtaining border clearance for aircraft cargo, passengers, crew and baggage, if required, before takeoff to a foreign area or after arrival from a foreign area.

6.46.1.2.6. Spraying the aircraft (see the FCG and Paragraph 6.47.).

6.46.2. Procedures for US Entry.

6.46.2.1. En route, the loadmaster will distribute personal customs declarations (when not accomplished by passenger services) to all passengers, troops, and crewmembers. The loadmaster will also brief passengers and crewmembers on customs regulations, and prepare and compile necessary border clearance forms for the PIC's signature.

6.46.2.2. En route, notify the C2 agency at the base of intended landing of any change in ETA to ensure that border clearance is accomplished as soon as possible after landing.

6.46.2.3. Obtain a permit to proceed when military necessities require that an aircraft, which has landed in the United States for customs clearance, to proceed to another base in the US to obtain border clearance. The permit to proceed delays customs inspection of cargo, passengers, and crew until arrival at the offload station, and saves intermediate offloading and reloading normally required for customs inspection. The permit to proceed is valid only to the airport of next landing where the border clearance must be completed or a new permit to proceed issued by a customs official. Do not make intermediate stops between the issue point of the permit to proceed and destination of manifested cargo unless required by an emergency or directed by the controlling C2 center.

6.46.2.4. When an aircraft lands for a US border clearance, a US Customs representative normally will meet the aircraft to obtain the required documents. Do not deplane passengers, troops, or crewmembers unless necessary for safety or the preservation of life and property (scanner excepted). Do not unload until approved by customs and agriculture personnel or their designated representatives. This procedure applies to the initial landing in the US and all landings required when operating on a permit to proceed or until all crew, passengers, and cargo complete final border clearance.

6.46.3. Inspections of U.S. Aircraft by Foreign Officials.

6.46.3.1. Follow USAF policy on status of military aircraft as stated in the FCG, *General Information* (Chapter 3). In substance, this policy holds that US military aircraft are immune from searches, seizures, and inspections (including customs and safety inspections) by foreign officials. In addition, ACs must be aware of, and adhere to, any specific FCG provisions for individual countries.

6.46.3.2. If confronted with a search request by foreign authorities, aircrews should use the following procedures:

6.46.3.2.1. In most cases, search attempts may be halted simply by a statement of the PIC to the foreign official that the aircraft is a sovereign instrumentality not subject to search without consent of USAF headquarters or the US Department of State officials in the country con-

cerned. This should be clearly conveyed in a polite manner so as not to offend foreign authorities that may honestly, but mistakenly, believe they have authority to search USAF aircraft.

6.46.3.2.2. If foreign authorities insist on conducting a search, the PIC should make every effort to delay the search until he or she can contact USAF headquarters (through MAJCOM C2) or the appropriate embassy officials. The PIC should then notify these agencies of foreign request by the most expeditious means available and follow their instructions.

6.46.3.2.3. If foreign officials refuse to desist in their search request, pending notification to USAF headquarters or the appropriate embassy, the PIC should indicate that he or she would prefer to fly the aircraft elsewhere (provided fuel, flying time, and mechanical considerations permit a safe flight) and request permission to do so.

6.46.3.2.4. If permission is refused and the foreign authorities insist on forcing their way on board an aircraft, the PIC should state that he protests the course of action being pursued and that he intends to notify both USAF headquarters and the appropriate American embassy of the foreign action. The PIC should not attempt physical resistance, and should thereafter report the incident to USAF headquarters and appropriate embassy as soon as possible. The PIC should escort foreign authorities if the inspection cannot be avoided.

6.46.3.3. Other procedures may apply when carrying sensitive cargo or equipment. Follow these procedures and applicable portions of classified FCG supplements.

6.46.4. Exercises and Contingency Operations.

6.46.4.1. General. Certain airlift missions, which do not transit normal ports of entry or exit, require special procedures to expedite compliance with customs, public health, immunization, and agricultural requirements. A joint memorandum of understanding, between these agencies and MAJCOM establishes certain procedures and waivers.

6.46.4.2. Implementation. Implementation of the agreement is not automatic. Traffic and border clearing agencies implement all or part of the agreement as necessary for each operation. Inspection and clearance may be accomplished at the US onload or offload base, or at the foreign onload or offload base.

6.46.4.3. Customs Procedures.

6.46.4.3.1. Outbound: No requirement. Filing of Customs Form 7507, **General Declaration (Outward/Inward)**, is not required unless directed.

6.46.4.3.2. Inbound. Prepare one copy of the following documents before arrival:

6.46.4.3.2.1. Customs Form 7507 (Passenger list not required).

6.46.4.3.2.2. Cargo manifest.

6.46.4.3.2.3. For troops out of country less than 140 days:

6.46.4.3.2.3.1. Troop commander's certificate for examination of troop baggage.

6.46.4.3.2.3.2. One copy of the US Customs Baggage Declaration Form for each passenger not under command of the troop commander, to include observers, support personnel, civilians, news reporters, and crewmembers.

6.46.4.3.2.3.3. Upon arrival at a CONUS offload base, a customs representative will meet the aircraft and accept the troop commander's certificate with respect to troop baggage. Individual baggage declarations are not required. The troop commander should have inspected troop baggage.

6.46.4.3.2.3.4. Troops will debark under the observation of the customs representative with only a spot check of articles and baggage. The customs officer may elect to make a more extensive inspection.

6.46.4.3.2.4. For troops who are out of the country 140 days or more:

6.46.4.3.2.4.1. One copy of the U.S. Customs Baggage Declaration Form for each passenger. This includes observers, support personnel, civilians, news media personnel, and crewmembers. Personnel may use DD 1854, **Customs Accompanied Baggage, U.S.**, or Customs Form 6059B.

6.46.4.3.2.4.2. Upon arrival at a CONUS offload base, a customs representative will meet the aircraft and collect all declarations. Troops will debark under the observation of the customs representative who may make discretionary examination of the baggage.

6.46.4.4. Public Health Procedures.

6.46.4.4.1. When operating from a base without a traffic officer, the AC will ensure all crewmembers and passengers are properly immunized.

6.46.4.4.2. Spray the aircraft if required.

6.46.4.5. Immigration Procedures.

6.46.4.5.1. Outbound: No requirements.

6.46.4.5.2. Inbound: Submit the following to the immigration inspector if carrying civilian passengers.

6.46.4.5.2.1. One copy of Customs Form 7507 (found at <http://www.customs.gov>).

6.46.4.6. Agriculture Procedures:

6.46.4.6.1. Outbound: No requirements.

6.46.4.6.2. Inbound: Consult AMC Border Clearance Guide.

6.46.4.6.2.1. The command being airlifted will instruct troops that no fresh fruit, milk, milk products, vegetables, plants, plant pests, soil samples, animals, meat, and animal products can be brought into the United States. All items of troop personal gear/cargo are to be thoroughly cleaned of mud, dirt, sand, and other foreign material before being brought aboard the aircraft. Personal gear and equipment must be examined for snails and other plant pests to prevent their accidental entry into the U.S.

6.46.4.6.2.2. Before loading, the command responsible for cargo being airlifted will clear vehicles and cargo of snails or other plant pests and of all mud and soil.

6.46.4.6.2.3. When required by agricultural quarantine regulations, the FCG, or higher headquarters, the aircraft will receive an aerosol treatment 30 minutes before landing.

6.46.4.6.2.4. On arrival, agricultural inspectors will inspect the aircraft after troops have disembarked. Crewmembers will assemble remains of in-flight lunches for prompt removal by fleet service personnel.

6.46.4.6.2.5. Inspectors examine baggage, equipment, vehicles, and cargo as offloaded. Any items, vehicles, or cargo found to be contaminated will be held for such treatment as the inspector may direct (washing, steam cleaning, physical cleaning, or fumigation).

6.46.5. Military Customs Pre-clearance Inspection Program. All crewmembers will ensure compliance with Military Customs Pre-clearance requirements.

6.46.6. Lodging: For all en route arrivals, the PIC will provide the appropriate C2 crew orders, so the C2 can notify the next RON location for lodging arrangements

6.47. Insect and Pest Control.

6.47.1. Responsibility. PICs will ensure required spraying is accomplished according to AFJI 48-104, *Medical and Agricultural Foreign and Domestic Quarantine Regulations for Vessels, Aircraft, and Other Transports of the Armed Forces (Joint)*, Department of Defense FCG, or as directed by higher headquarters. Certify the spraying on Customs Form 7507, or on forms provided by the country transited. Aircraft should never be sprayed with passengers on board. The only exception is when mandated by the FCG.

6.47.1.1. When spraying is required, use insecticide, aerosol d-phenothrin-2 percent, National Stock Number (NSN) 6840-01-067-6674 (or equivalent), to spray the aircraft. Wear leather or Nomex gloves while spraying.

6.47.1.1.1. Direct the nozzle toward the ceiling of the compartment or space being sprayed.

6.47.1.1.2. Spray spaces inaccessible from within the aircraft after completely loading fuel, baggage, cargo, and passengers, including baggage compartments, wheel wells, and other similar spaces.

6.47.1.1.3. Spray the cabin, cockpit, and other spaces accessible from within the aircraft after the crew is aboard and after closing all doors, windows, hatches, and ventilation openings.

CAUTION: If the insecticide label directs disembarkation after use, spray before boarding crew or passengers. Close all doors and hatches for 10 minutes after dispensing and ventilate for 15 minutes before allowing anyone on board.

6.47.1.2. Duration if spray will be according to [Table 6.4](#), unless longer periods are specified for the country being transited.

Table 6.4. Spray Chart.

Location	Seconds
Crew Compartment	42
Troop Compartment	50
Cargo Compartment	374
Underfloor Compartment	51

NOTE: Keep used aerosol cans separate from other trash so they may be disposed of safely.

6.47.2. Responsibility of PIC In-flight. When seeing any insect or rodent infestation of the aircraft in-flight, notify the destination C2 center, airfield management operations, or airport manager of the situation before landing so the proper authorities can meet the aircraft.

6.47.3. Procedure at Aerial Port of Disembarkation (APOD). On arrival at an APOD, do not open cargo doors or hatches except to enplane officials required to inspect the aircraft for insect or rodent infestation. Do not onload or offload cargo or passengers until the inspection is satisfactorily completed. This procedure may be altered to satisfy mission or local requirements, as arranged by the base air terminal manager or the local C2 organization.

Section 6G—Miscellaneous

6.48. Dropped Objects. If an externally dropped object is discovered, the flight crew will:

6.48.1. Notify 618 TACC or the controlling agency as soon as practical; include details of routing, altitude, weather, etc.

6.48.2. Notify maintenance at the first military station transited.

6.49. Cockpit Voice Recorder (CVR). If involved in a mishap or incident, after landing and terminating the emergency, pull the CVR power circuit breaker.

6.50. Life Support and Dash 21 Equipment Documentation. The PIC or designated representative will:

6.50.1. Before departing home station or en route stations, ensure appropriate serviceable protective clothing, life support, survival, and dash 21 equipment for the entire or remainder of the mission are aboard the aircraft.

6.50.2. Before departing home station and following en route crew changes, review AF 4076, **Aircraft Dash 21 Equipment Inventory**, to ensure all required dash 21 equipment has been certified as installed by maintenance, the initial check has been signed by maintenance, and configuration documents match mission requirements.

6.50.3. Before departing home station and following en route crew changes, review, sign, and date the AFTO 46, **Prepositioned Life Support Equipment**, to ensure all required protective clothing and life support and survival equipment have been certified as installed by aircrew life support and that configuration documents match mission requirements. Ensure appropriate number and type of life preservers are aboard for over-water missions carrying children and infants.

6.50.4. Missing Equipment. Aircrew members discovering equipment missing will accomplish the following:

6.50.4.1. Make an AFTO 781A entry for equipment found missing. Additionally, ensure equipment removed from the aircraft at an en route station is documented in the AFTO 781A.

6.50.4.2. Annotate AF 4076 and AFTO 46 in the next vacant column indicating the quantity remaining for the item. Ensure the ICAO location designator is entered above the check number of that column. Leave AF 4076 and AFTO 46 on board the aircraft in the event of an en route crew change.

6.50.4.3. Advise the PIC and determine whether the missing equipment should be recovered or replaced before mission continuation.

6.50.4.4. Assist, as required, in preparing reports of survey for missing equipment.

6.50.4.5. When possible, advise HQ AMC/A37TL (or MAJCOM life support office) and appropriate C2 agency (or airport management) before mission continuation.

6.50.5. Additional Equipment. If more equipment is discovered during the preflight than is annotated on the AF 4076 or AFTO 46, annotate the total quantity in the next vacant column for the item. Ensure the ICAO location designator is entered above the check number of that column.

6.51. Passenger Restrictions. .

6.51.1. No-show passenger baggage or baggage of passengers removed from flight will be downloaded prior to departure.

6.51.2. The cargo compartment will not be used to airlift personnel, except with specific approval of MAJCOM/A3.

6.52. Airfield Data Reports. Aircrews transiting unfamiliar airfields or airfields where conditions may adversely affect subsequent flight will:

6.52.1. Report airfield characteristics that produce illusions, such as runway length, width, slope, and lighting, as compared to standard runways, sloping approach terrain, runway contrast against surrounding terrain, haze, glare, etc. and previously unknown obstacles, airfield markings, or other safety critical items to HQ AMC/A36AS.

6.52.2. Debrief the next C2 center transited.

6.53. Impoundment of Aircraft. If an aircraft is involved in a serious in-flight incident, the PIC should impound the aircraft immediately after landing and contact the controlling C2 agency for further instructions.

6.54. Not Used

6.55. Wake Turbulence Avoidance. Comply with wake turbulence avoidance criteria. Acceptance of traffic information, instructions to follow an aircraft, or a visual approach clearance is acknowledgment that the PIC will ensure takeoff and landing intervals and accepts responsibility of providing wake turbulence separation. Refer to FLIP General Planning (GP) section 5-37 for more information concerning wake turbulence separation.

6.56. Overflying En Route Stops. The C2 agency may approve a request to overfly a scheduled en route stop (ANG/DOD for ANG-directed missions, AFRC command center for AFRC-directed missions).

6.57. Ordnance Procedures. Conduct the following procedures after the live firing of chaff/flares or the crew suspects aircraft battle damage:

6.57.1. After landing, taxi to the de-arm area or another suitable safe location to check for hung ordnance.

6.57.2. The scanner or another qualified crewmember will deplane the aircraft and check all chaff/flare dispensers for hung ordnance or damage.

NOTE: ALE-40/47 flare squibs that fail to fire are not considered hung ordnance.

6.57.3. If hung ordnance is found, identified by a protruding or partially ejected flare cartridge, the aircraft will remain in a de-arm area until Explosive Ordnance Disposal (EOD) personnel meet the aircraft. The aircraft must remain in the designated safe area until EOD personnel can clear all hung ordnance.

6.57.4. If hung ordnance is not found, the aircraft can proceed to the parking location.

6.58. Distinguished Visitor (DV) Airlift.

6.58.1. This establishes aircrew responsibilities for transporting distinguished visitors (DV Code 6 and above). DV travel may occur anywhere within the AMC system, and any crew may be tasked to carry DVs. They should be given special attention within the limits of available resources in a manner that reflects favorably on AMC.

6.58.1.1. All DVs code 6 and above (to include DV travel party) may be seated in the courier compartment (maximum of eight seats). The PIC may invite the senior DV to occupy the observer seat during all phases of flight if the seat is not required for training or evaluation purposes.

6.58.1.2. Set aside the following areas for DV use:

6.58.1.2.1. Courier Compartment.

6.58.1.2.2. Aft Bunk Area. The bunk will be made up with sheets and blankets (request fleet service assistance). The forward bunk area should normally be used by aircrew personnel only.

6.58.1.3. No special meal service will be provided.

6.58.2. The primary crew will be in their seats with the Before Starting Engines Checklist completed prior to DV arrival at the aircraft. The crew should be prepared to start engines as soon as the DV is aboard the aircraft. The DV and party will be greeted at the aircraft by an officer designated by the PIC. The greeting officer should assist the DV up the ladder and flight deck stairway to his or her seat. A crewmember will brief the DV, using the DV Briefing checklist (CL1).

6.59. Classified Equipment and Material. Comply with the following or as directed in MAJCOM supplement:

6.59.1. Equipment. When classified equipment is onboard, ensure the C2 Center or airfield management operations office is aware of the requirement for aircraft security according to [Chapter 7](#) of this AFI. At bases not under jurisdiction of the Air Force, ensure the aircraft and equipment are protected.

AFI 31-401, *Information Security Program Management*, provides specific guidance concerning the security of various levels of classified equipment aboard aircraft. For classified aircraft components which cannot be removed and stored, lock and seal the aircraft. If available, use Ravens to guard the aircraft; otherwise, use guards employed by the host country for flightline/airport area control. Do not leave unguarded classified information stored in navigation or radio equipment.

6.59.2. Material. Ensure COMSEC and other classified materials are turned in at destination and receipts are obtained for COMSEC and classified material. The on-site C2 center will provide temporary storage for COMSEC and other classified materials during en route, turnaround, and crew rest stops. If a storage facility is not available, the aircraft gun storage box may be used for material classified up to and including SECRET. Encrypted COMSEC will only be transferred to authorized DoD personnel.

6.59.3. Aircrews will ensure that they have an operable Mode 4 when required for mission accomplishment. Aircrews will conduct an operational ground test of the Mode 4 (ground test assets permitting) before deployment overseas, or as specified in the OPORD or contingency/exercise tasking.

6.59.4. Attempt to fix an inoperable Mode 4 before takeoff. Do not delay takeoff nor cancel a mission for an inoperable Mode 4, except when the aircraft will transit an area where safe passage procedures are implemented.

6.59.5. Conduct an in-flight check of the Mode 4 on all missions departing the CONUS for overseas locations. Aircrews can request the Mode 4 interrogation check through NORAD on UHF frequency 364.2.

6.59.6. Aircraft with inoperable Mode 4 will continue to their intended destinations. Repairs will be accomplished at the first destination where equipment, parts, and maintenance technicians are available. In theaters where safe passage is implemented, aircraft will follow procedures for inoperable Mode 4 as directed in the applicable airspace control order or Airspace Control Order (ACO).

6.59.7. Ground and in-flight checks of the Mode 4, when conducted, are mandatory maintenance debrief items. Crews will annotate successful and unsuccessful interrogation of the Mode 4 on aircraft forms (AFTO IMT 781A).

6.59.8. Aircrews will carry COMSEC equipment and documents required to operate the Mode 4 on missions when required for mission accomplishment. Before departing for any destination without COMSEC storage facilities, crews will contact their local COMSEC managers for guidance.

6.60. Maintenance Opportune Training.

6.60.1. All aircraft in the en route system on AMC missions are available for opportune training except those designated non-available in the advisory section of GDSS Form 59 by the 618 TACC (i.e. SAAM, 1A1, Phoenix Banner, and Medevac missions). Mission planners will annotate the GDSS Form 59 for those missions not allowed to be used for opportune training. The en route maintenance production supervisor will brief the aircraft commander of the intention to train, either at the aircraft or at the air mobility command center, prior to entering crew rest. If a conflict arises between the crew and en route maintenance teams it should be routed through TACC duty officer/operations director for resolution. **NOTE:** Aircraft Commander approval is not required.

6.60.2. Training will not be performed on aircraft carrying hot cargo or on CLOSE WATCH missions. All training will be complete and the aircraft ready for flight not later than 2 hours prior to crew show. Crews are not required to remain with the aircraft while training is performed.

6.60.3. Use of ANG/AFRC aircraft will be supported on a pre-coordinated basis. The en route unit POC will coordinate with the owning ANG/AFRC wing command post to obtain permission to utilize the ANG/AFRC aircraft for training purposes.

Chapter 7

AIRCRAFT SECURITY

7.1. General. This chapter provides guidance on aircraft security and preventing and resisting aircraft piracy (hijacking) of the C-5 aircraft. AFI 13-207, *Preventing and Resisting Aircraft Piracy (Hijacking)*, AFI 31-101, *The Air Force Installation Security Program*, and specific MAJCOM security publications contain additional guidance. Aircrews will not release information concerning hijacking attempts or identify armed aircrew members or missions to the public.

7.2. Security. The C-5 is a Protection Level 3 resource. Aircraft security at non-United States military installations is the responsibility of the controlling agency.

7.3. Air Force Installation Security Program. The following security procedures will implement AFI 31-101, *The Air Force Installation Security Program*, requirements for C-5 aircraft:

7.3.1. The aircraft will be parked in an established restricted area and afforded protection via a two-person Internal Security Response Team (ISRT), with immediate response not to exceed 3 minutes, and a two-person External Security Response Team, (ESRT) with response capability within 5 minutes.

7.3.2. When no permanent or established restricted area parking space is available, establish a temporary restricted area consisting of a raised rope barrier, and post with restricted area signs. Provide ESRT 5-minute response and the ISRT from existing areas can respond to this area if able to maintain 3-minute response within their primary area. Portable security lighting will be provided during the hours of darkness if sufficient permanent lighting is not available.

7.3.3. At non-United States military installations, the PIC determines the adequacy of local security capabilities to provide aircraft security commensurate with this chapter. If he or she determines security to be inadequate, the aircraft will depart to a station where adequate security is available.

7.3.4. The security force must be made aware of all visits to the aircraft. The security force POC must be identified to the PIC.

7.3.5. Security support is a continual requirement and is not negated by the presence of aircrew or ground crew members. Security force support terminates only after the aircraft doors are closed and the aircraft taxis.

7.3.6. Locking and Sealing. Lock or seal the aircraft during a remain over night (RON) on non-secure ramps (see paragraph 7.6.1.).

7.4. Standby Aircraft Security. The PIC shall ensure aircraft hatches and doors are secure to show unauthorized entry. Seal the crew entrance door with a box car seal, or other controllable device, which will prevent entry without damaging the door or lock. The PIC shall notify the C2 agency the aircraft is sealed and provide them a means to access the aircraft in an emergency. Annotate the forms with the time the aircraft was sealed. The C2 Senior Controller may grant access to a sealed aircraft, shall document time of entry and ensure it remains launch capable. The PIC or designated representative must be present if access to the aircraft is required and will ensure the aircraft is resealed. The aircrew pre-flight will remain valid if performed by one aircrew, sealed, and flown by another aircrew.

NOTE: WG/CCs should develop local procedures for documentation and management IAW TO 00-20-1 and MAJCOM Supplement.

7.5. En Route Security. The planning agency must coordinate with the execution agency to ensure adequate en route security is available. The PIC will receive a threat assessment and en route security capability evaluation briefing for areas of intended operation prior to home station departure and should request updates from en route C2 as required. If required, a PHOENIX RAVEN team will be assigned to the mission.

7.5.1. The PHOENIX RAVEN team will consist of three US Air Force security force members, but may include more depending on security requirements. The team's travel status is determined by MAJCOM. The team travels in MEGP status and is responsible to the PIC at all times. In turn, the PIC is responsible for its welfare (transportation, lodging, etc.). Ensure security team members receive a mission briefing, aircraft egress/passenger briefing (as appropriate).

7.5.2. Arrival. On arrival, the PIC will assess the local situation and take the following actions as required:

7.5.2.1. Area patrol. Request area security patrols from local security forces. If local authorities request payment for this service, use AF IMT 15, **USAF Invoice**.

7.5.2.2. Aircrew surveillance. During short ground times, direct armed crew members to remain with the aircraft and maintain surveillance of aircraft entrances and activities in the aircraft vicinity.

7.5.2.3. Inadequate Security. If in the PIC's opinion, airfield security is inadequate and the PIC determines the safety of the aircraft is in question, the PIC may waive the FDP limits and crew rest requirements and depart as soon as possible for a base considered reliable. Report movement and intentions to the controlling agency as soon as practical. If a departure is not possible, the aircrew must secure the aircraft to the best of their ability. In no case, will the entire crew leave the aircraft unattended. Crew rest requirements will be subordinate to aircraft security when the airframe may be at risk. The PIC should rotate a security detail among the crew to provide for both aircraft protection and crew rest until relief is available. Request security assistance from the nearest DoD installation, US Embassy, local military or law enforcement agencies as appropriate.

7.5.3. Entry Control Procedures. Unescorted entry is granted to aircrew members and support personnel assigned to the mission who possess their home station AF 1199, **Air Force Entry Control Card**, supported by an Entry Access List (EAL) or aircrew orders. Aircrew members and assigned crew chiefs are authorized escort authority.

7.5.3.1. Normally, non-United States nationals, such as cargo handlers, can perform their duties under escort and should not be placed on the EAL.

7.5.3.2. Personnel not on the EAL or aircrew orders must be escorted within the area.

7.6. Detecting Unauthorized Entry.

7.6.1. When parking on a secure ramp, the aircraft will normally be left unlocked/unsealed to allow ground personnel immediate access. If, in the PIC's judgment, the aircraft needs to be locked and sealed in order to detect unauthorized entry, then:

7.6.1.1. Use available aircraft ground security locking devices.

7.6.1.2. Secure the doors in a manner that will indicate unauthorized entry (e.g., tape inside of doors to airframe so that entry pulls tape loose).

7.6.1.3. Close and seal the crew entrance door (box car seal).

7.6.1.4. Wipe the immediate area around lock and latches clean to aid in investigation of a forced entry.

7.6.1.5. Report any unauthorized entry or tampering to the Office of Special Investigation (OSI), security forces or local authorities, and the C2 agency. Have aircraft thoroughly inspected prior to flight.

7.6.2. Security awareness is crucial to effective mission accomplishment. Aircrews must always remain vigilant to their surroundings, especially at high threat, low security locations. In addition to normal preflight activities, aircrews must inspect areas of the aircraft that may not be covered by normal preflight duties, to include aircraft wheel wells, flap pack area, aft empennage area, avionics compartments, and boiler room compartment of the aircraft for unauthorized packages, personnel, or other unfamiliar devices.. Report any suspicious items to host security forces. Aircrews will maintain a heightened security posture throughout all pre-takeoff activities.

7.7. Preventing and Resisting Hijacking.

7.7.1. The Air Transportation Act of 1974 and the Federal Aviation Act of 1958, as amended, vest the FAA Administrator with exclusive responsibility for the direction of law enforcement activity in aircraft hijacking situations involving all aircraft (civil and military) in-flight in the United States.

7.7.2. In taking action during an aircraft hijacking situation, military forces will act under military command within the scope of their duties.

7.7.3. In the event an aircraft involved in an aircraft hijacking situation is carrying documents, equipment, or material that DoD has determined to be highly sensitive, or weapons of mass destruction, DoD will provide FAA, and where appropriate, the Federal Bureau of Investigation (FBI) with all pertinent information. Where possible, the FAA will consult and cooperate with DoD prior to directing any law enforcement activity.

7.7.4. An aircraft is most vulnerable to hijacking when the aircrew is aboard and the aircraft is operationally ready for flight.

7.7.5. A concerted effort must be made to prevent the hijacking of military or military contract aircraft by detecting potential hijackers before they board the aircraft.

7.7.6. Should preventive efforts fail, any actual attempt to hijack a military aircraft must be resisted in a manner appropriate to the situation.

7.7.7. Since air piracy may be committed by political terrorists or by individuals to whom the threat of death is not a deterrent but a stimulus, ordinary law enforcement procedures may be ineffective. Thus, successful conclusion of a hijacking situation and apprehension of the hijackers may require use of specialized law enforcement techniques and procedures.

7.7.8. Delaying actions have been most successful in overcoming hijackings without loss of life or property.

7.7.9. In the case of an aircraft carrying passengers, normally the primary concern is the safety of the passengers. However, at times control of the aircraft will be paramount even to the detriment of the safety of the passengers and aircrew.

7.7.10. Assistance to hijacked civil or military contract aircraft will be rendered as requested by the pilot in command of the aircraft and the authority exercising operational control of the anti-hijacking effort.

7.8. Preventive Measures. Commanders at all levels must ensure preventive measures are taken to minimize access to the aircraft by potential hijackers. When a C-5 is operating away from home station, the PIC will comply with this chapter and AFI 13-207, as supplemented.

7.8.1. Preventive measures include the following: The host station passenger processing or manifesting facility should conduct anti-hijacking inspections. Do not board passengers until the PIC is fully satisfied with inspection results. In the absence of qualified passenger service representatives, the PIC will ensure the anti-hijacking inspection of passengers and baggage is accomplished.

7.8.2. Medical facility commanders are responsible for anti-hijacking inspection of patients. When patients are delivered to the aircraft by civilian sources, the aircrew will perform required inspections prior to loading.

7.8.3. During exercises or contingencies in support of combat operations involving the movement of large groups of personnel, the unit being supported should manifest passengers and perform anti-hijacking inspections.

7.8.4. Passengers will not carry weapons or ammunition on their person or in hand-carried baggage aboard an aircraft. **EXCEPTION:** Special agents, guards of the Secret Service or State Department, RAVEN Team Members, and other individuals specifically authorized to carry weapons.

7.8.4.1. Troops or deadhead crewmembers will not retain custody of ammunition on an aircraft. They will turn it in to the troop commander or PIC. Troops may carry unloaded weapons and ammunition aboard the aircraft during combat operations. When the tactical situation dictates (in coordination with the aircrew), weapons may be loaded at the order of the troop commander or team leader.

7.8.4.2. Dummy clips that can be easily identified may be loaded for training at the order of the team leader in coordination with the aircrew.

7.8.4.3. RAVENs will only be armed in-flight on specifically designated missions identified on the mission frag as RAVEN in-flight arming required.

7.8.5. If weapons must be cleared, instruct the individual(s) to:

7.8.5.1. Move to a safe, clear area at least 50 feet from any aircraft, equipment, or personnel before un-holstering or un-slinging their weapons.

7.8.5.2. Clear weapons in accordance with standard safety procedures. Ensure troop/PIC retains ammunition IAW paragraph [7.8.4.1](#).

7.9. Initial Response. When an act of air piracy involves an Air Force installation or aircraft within the United States, response will be according to the following guidelines until such time as FAA assumes active direction of anti-hijacking efforts. Resist all attempts to hijack a military aircraft. Resistance may

vary from simple dissuasion, through deception and subterfuge, to direct physical confrontation, including the prudent use of weapons.

7.9.1. The following guidelines should be used to counter a hijacking, actual or threatened, while the aircraft is on the ground:

7.9.1.1. Delay movement of the aircraft to provide time for ground personnel and the aircrew to establish communication and execute coordinated resistance actions.

7.9.1.2. The authority for determining when ground resistance will be discontinued is vested in the highest available level of command. When adequate communication cannot be established, or when time does not permit, this authority is delegated in the following order:

7.9.1.2.1. MAJCOM commander exercising operational control of the aircraft.

7.9.1.2.2. MAJCOM commander in whose AOR the airfield lies.

7.9.1.2.3. Senior operational commander on scene.

7.9.1.2.4. PIC in compliance with MAJCOM directives.

7.9.2. A hijacked aircraft carrying weapons of mass destruction will not be allowed to takeoff. Refer to DoD 5210.41M, paragraph 9B(3), for additional guidance.

7.10. In-Flight Resistance. After airborne, success in thwarting a hijacking depends on the resourcefulness of the aircrew. Many variables of a hijacking preclude use of any specific counter-hijacking procedure. Some key factors should be evaluated before deciding a course of action to be taken, including the nature of the threat, danger to life or crippling damage to the aircraft in-flight, destination indicated by the hijacker, and the presence of sensitive material onboard. Some counter-hijacking actions the aircrew may consider are:

7.10.1. Engage the hijacker(s) in conversation in an attempt to calm them and to evaluate what course of action might be effective.

7.10.2. Dissuade the hijacker.

7.10.3. Use facts or subterfuge to convince the hijacker intermediate stops are necessary.

7.10.4. Propose more favorable alternatives, such as landing in a neutral, rather than a hostile, country.

7.10.5. Exploit any reasonable opportunity to incapacitate or overcome the hijacker physically, including the prudent use of firearms.

7.11. Communications Between Aircrew and Ground Agencies. Crews facing a hijacking threat will notify ground agencies by any means available as soon as practical and follow up with situation reports as circumstances permit.

7.11.1. If possible, transmit an in-the-clear notification of hijacking to ATC. Controllers will assign IFF code 7500 (does not preclude subsequent selection of code 7700).

7.11.2. If in-the-clear transmissions are not possible, report "am being hijacked" by setting transponder to code 7500. If unable to change transponder code, or when not under radar control, transmit a radio message to include the phrase "(call sign) transponder seven five zero zero."

7.11.3. Controllers will acknowledge receipt and understanding of transponder code 7500 by transmitting "(call sign) (facility name) verify squawking 7500." An affirmative reply or lack of reply from the pilot indicates confirmation and proper authorities are notified.

7.11.4. To report "situation appears desperate; want armed intervention," after code 7500 is used, change to code 7700. If unable to change transponder code to 7700, or when not under radar control, transmit "(aircraft call sign) transponder seven seven zero zero."

7.11.4.1. When changing from code 7500 to code 7700, remain on 7500 for at least 3 minutes or until a confirmation of code 7500 is received from ATC, whichever is sooner, before changing to code 7700. ATC acknowledges code 7700 by transmitting "(call sign) (facility name) now reading you on transponder seven seven zero zero."

7.11.4.2. Aircraft squawking 7700 after squawking 7500, which are not in radio contact with ATC, are considered by ATC to have an in-flight emergency (in addition to hijacking), and the appropriate emergency procedures are followed. Notification of authorities in this case includes information that the aircraft displayed the hijack code as well as the emergency code.

7.11.5. To report "situation still desperate, want armed intervention and aircraft immobilized", leave flaps full down after landing, or select landing flaps while on the ground. To facilitate message distribution, transmit "(aircraft call sign) flaps are full down."

7.11.6. To report "leave alone, do not intervene," retract the flaps after landing. Pilots who retract flaps after squawking 7700 should return to code 7500 and remain on code 7500 for the next leg of the hijacked flight unless the situation changes. Transmit "(call sign) back on seven five zero zero" to emphasize the fact intervention is no longer desired.

7.12. Forced Penetration of Unfriendly Airspace. Refer to FIH for international signals for air intercept.

7.13. Arming of Crew Members. When crews are directed to carry weapons, two loadmasters and one flight engineer (normally, the scanner) will be armed. All crew members should know who is armed. The following procedures apply when arming is directed:

7.13.1. Weapons Issue. Before departing home station, obtain weapons, ammunition, box, lock and key. Crew members will be armed according to AFI 31-207, *Arming and Use of Force by Air Force Personnel* and MAJCOM publications. If an armed crew member must leave the crew en route, transfer the weapon to another authorized crew member using AF IMT 1297.

7.13.2. Wearing of Weapons. Wear weapons in a holster, concealed at all times to prevent identifying armed crew members. Do not wear weapons off the flight line except to and from the C2, armories, and other facilities associated with aircrew activities.

7.13.2.1. AMC Passenger Terminal Procedures. Armed crewmembers must discreetly identify themselves to AMC passenger service personnel upon arrival at security checkpoints. One crewmember will present a valid set of crew orders, his/her military identification card, and AF 523, **USAF Authorization to Bear Firearms**, authorizing the carrying of concealed weapons. Once terminal personnel verify this, they will allow the crewmember to vouch for the remaining crewmembers. The entire crew will then proceed through the magnetometer without removing objects from their pockets. This will prevent passengers from determining which crewmembers are armed.

7.13.3. Weapons Storage In-Flight. Crew members will be armed before beginning preflight, on-load or off-load duties and until completion of all post-flight duties. When no passengers are aboard, weapons may be stored in the gun box in-flight after a satisfactory stowaway check. Crew members will rearm before landing. Weapons need not be unloaded before placing them in a gun box.

7.13.4. Weapons Storage on the Ground.

7.13.4.1. Aircrews, including stage crews, will store weapons and ammunition in the most secure facility available, normally the base armory.

7.13.4.2. Non-stage aircrews may store weapons and ammunition in the aircraft gun box.

7.13.5. When storing weapons in the gun box:

7.13.5.1. Weapons should normally not be unloaded.

7.13.5.2. Inform C2 which crew member has the gun box key.

7.13.6. Crew members will ensure they are reissued the same weapon until mission termination at home station.

7.13.7. Loading and Transfer of Weapons. Load and unload weapons at approved clearing barrels if available. Do not use a hand-to-hand transfer of loaded weapons to another crew member; place the weapon on a flat surface.

7.14. Force Protection. Crews must be alert to possibility of terrorist activities at all times. Reference AFMAN 10-100, *Airman's Manual*, Joint Service Guide 5260, *Service Member's Personal Protection Guide: Combat Terrorism While Overseas*, and AFI 10-245, *Air Force Antiterrorism*, for Force Protection measures.

Chapter 8

OPERATIONAL REPORTS AND FORMS

8.1. General. This chapter provides guidelines for worksheets, reports, and forms associated with AMC operational activities. Consult governing instruction or contact wing, unit, or local flight safety officers for assistance with safety forms.

8.2. AF IMT 457, USAF Hazard Report. The AF IMT 457 is a tool to notify supervisors and commanders of a hazardous condition that requires prompt corrective action. For hazardous weather, complete the front side of an AF IMT 457 and send it to the parent wing flying safety office. If addressing a computer flight plan deficiency, attach a copy of the AF IMT 72, **Air Report (AIREP)**. Send your report so the parent unit receives it within 5 days of the event. For more information, see AFI 91-202, *The US Air Force Mishap Prevention Program*.

8.3. AF IMT 651, Hazardous Air Traffic Report (HATR). The AF IMT 651 is a tool to report near midair collisions and alleged hazardous air traffic conditions. See Attachment 3 of AFI 91-202 for more information concerning the HATR program.

8.3.1. AFI 91-204, *Safety Investigations and Reports*, and AFMAN 91-223, *Aviation Safety Investigations and Reports*, list HATR reportable incidents.

8.3.2. The PIC shall report the hazardous condition to the nearest ATC agency (e.g. center, Flight Service Station (FSS), control tower, or aeronautical radio station) as quickly as safety allows. Include the following information in the radio call (as appropriate)

8.3.2.1. Aircraft identification or call sign.

8.3.2.2. Time and place (radial/DME of NAVAID, position relative to the airfield, incident, etc).

8.3.2.3. Altitude or flight level.

8.3.2.4. Description of the other aircraft or vehicle.

8.3.2.5. Advise controlling ATC agency that the PIC will file a HATR upon landing.

8.3.3. Deadline to file a HATR is 24 hours after event via any communication mode available. If landing airport has a USAF airfield management function, submit completed AF IMT 651 to the airfield management officer for forwarding to the wing safety office. If landing airport does not have an airfield management office, notify the safety office of the Air Force base nearest to location where the condition occurred, PIC's home base safety office, or as prescribed by overseas MAJCOM. In that case, provide contact sufficient information to prepare AF IMT 651.

8.3.4. Grant individuals who submit a HATR immunity from disciplinary action provided:

8.3.4.1. If they were the offending party, their violation was not deliberate.

8.3.4.2. They committed no criminal offense.

8.3.4.3. Their actions did not result in a mishap.

8.3.4.4. They properly reported the incident using procedures above.

8.4. AMC IMT 97, AMC In-Flight Emergency and Unusual Occurrence Worksheet. The AMC IMT 97 is a tool to notify appropriate authorities of any mishap involving crewmembers or aircraft. PICs shall complete all appropriate areas of the form in as much detail as possible. When notified, AMC C2 agents will inform their supervisor/commander to start investigation and reporting activities IAW AFI 91-204 and Operation Report 3 (OPREP-3) procedures.

8.4.1. PICs will report crewmember or passenger injury, aircraft damage, or injury/damage to another organization's people or equipment caused by PIC's aircraft/crewmember. At a minimum, report the following:

8.4.1.1. Any physiological episode (physiological reaction, near accident, or hazard in-flight due to medical or physiological reasons). These include:

8.4.1.1.1. Proven or suspected case(s) of hypoxia.

8.4.1.1.2. Carbon monoxide poisoning or other toxic exposure.

8.4.1.1.3. Decompression sickness due to evolved gas (bends, chokes, neurocirculatory collapse), or severe reaction to trapped gas that results in incapacitation.

8.4.1.1.4. Hyperventilation.

8.4.1.1.5. Spatial disorientation or distraction that results in an unusual attitude.

8.4.1.1.6. Loss of consciousness regardless of cause.

8.4.1.1.7. Death by natural causes of any crewmember during flight.

8.4.1.1.8. Unintentional loss of pressurization if cabin altitude is above FL180, regardless of effects on people on board.

8.4.1.1.9. Inappropriate use of alcohol and effects of hangover that affect in-flight duties (crewmembers only).

8.4.1.1.10. Illness (both acute and preexisting), including food poisoning, dehydration, myocardial infarction, seizure, and so forth.

8.4.1.1.11. Exposure to toxic, noxious, or irritating materials such as smoke, fumes, or liquids.

NOTE: Crewmembers and passengers involved in a physiological episode will see a flight surgeon to be evaluated and to ensure the incident is reported in the Air Force Safety Automated System (AFSAS) as soon as practical.

8.4.1.2. A human factors related situation. Anonymous reports are acceptable. These are some examples of such situations: misinterpretation of instruments; information overload (i.e. tactile, aural, and visual input too fast to permit reasonable analysis/decision); aircrew task saturation (i.e. too many responses/actions required in a short period of time); or confused switchology (i.e. adjacent switches where actuation of wrong switch creates dangerous situation).

8.4.1.3. Any condition that requires engine shutdown after completing normal engine start sequence until normal engine shutdown, in-flight flameout, engine failure, suspected engine power loss, or loss of thrust that required descent below MEA. Engine failures include, but are not limited to, shrapnel from a failed internal engine component penetrating the engine case, engine case rupture/burn-through, engine nacelle fire, substantial fuel leak, or unselected thrust reversal. Consistent with safety, immediately report incidents that involve multiple engines (may report sin-

gle-engine incidents upon landing). **NOTE:** Exclude intentional shutdowns for training and/or FCF unless the engine fails to restart.

8.4.1.4. A flight control malfunction (including the autopilot and trim systems) that results in an unexpected or hazardous change of flight attitude, altitude, or heading. Enter the flag words, Reportable Flight Control Malfunction in the AFTO 781A, **Maintenance Discrepancy and Work Document write up.**

8.4.1.5. A landing gear malfunction aggravated by failed emergency system or procedures.

8.4.1.6. A cargo door, ramp or other door malfunction when intent for flight exists which could affect system integrity.

8.4.1.7. An in-flight loss of all pitot-static or gyro-stabilized attitude/directional instrument indications.

8.4.1.8. Any spillage/leakage of radioactive, toxic, corrosive, or flammable material from aircraft stores or cargo.

8.4.1.9. Conditions that required pilot to depart takeoff or landing surface.

8.4.1.10. All in-flight fires regardless of damage.

8.4.1.11. All damaging bird strikes. In addition, fill out and submit an AF Form 853, *Bird Strike Report*, regardless of damage.

8.4.1.12. Incidents that, in the PIC's judgment, are in the interest of flight safety.

8.4.2. Always provide the aircraft's home station safety officer a copy of relevant information. Make every effort to preserve all mission and flight related documents, such as flight plans, weather briefings, NOTAMS, Weight and Balance form, etc., for collection by appropriate safety officials. PICs shall use the following precedence to report mishaps (as soon as feasible after event):

8.4.2.1. MAJCOM flight safety officer (FSO).

8.4.2.2. Any FSO.

8.4.2.3. The nearest USAF C2 center.

8.4.2.4. Any USAF Airfield Management Operations.

8.5. Report Violations, Unusual Events, or Circumstances. PICs shall document events that require them to deviate from AFI 11-202V3 (unless waived by competent authority) or alleged navigation errors (include over-water position errors over 24NMs, border, or ATC violations).

8.5.1. Describe deviation(s) using the following report format:

8.5.1.1. Facts. Report pertinent details of the event.

8.5.1.2. Investigation and analysis. Report circumstances which required/drove deviation(s).

8.5.1.3. Findings and conclusions.

8.5.1.4. Recommendations to prevent recurrence.

8.5.1.5. Corrective actions taken.

8.5.2. Include the following attachments with the report:

- 8.5.2.1. Formal notification of incident.
- 8.5.2.2. AMC IMT 41 or approved crew orders.
- 8.5.2.3. Crewmembers' official statements (if applicable).
- 8.5.2.4. Other pertinent documents submitted in evidence (logs, charts, etc.).

8.5.3. In addition to above (when aircraft is equipped), PIC shall download original flight plan to a floppy disk and turn it in to the C2 center or parent standardization and evaluation office.

8.5.4. OG/CC shall send the original investigation report to the appropriate MAJCOM within 45 days of the event/notification. ANG/AFRC OG/CCs shall send original investigation report through channels to HQ AFRC/IGI within 35 days of the event/notification. HQ AFRC/IGI will send the investigation report to MAJCOM within 45 days of event/notification.

8.5.5. Use OPREP-3 reporting procedures contained in AFI 10-206, *Operational Reporting*, for navigation errors over 24 NMs.

8.5.5.1. When notified of a navigation position error, the PIC (or agency that receives initial notification) shall document the circumstances surrounding the incident (using report format below) and ensure C2 agents submit an OPREP-3.

8.5.5.2. Include the following information in the report:

8.5.5.3. The name and location of agency/unit submitting report.

8.5.5.4. Affected mission identification number.

8.5.5.5. Reference OPREPs-3 to determine type of event (i.e., state "navigation position error").

8.5.5.6. The date, time (Zulu), and location (e.g., ARTCC area) of alleged infraction.

8.5.5.7. Describe facts and circumstances. Include aircraft type and tail number, unit (aircrew's wing or squadron), home base, route of flight, point of alleged deviation, and miles off course.

8.5.6. PICs shall expeditiously report unusual events/circumstances that impact their mission to appropriate MAJCOM agencies. Reportable events include, but are not limited to, spectrum interference, interception, fuel dumping, multiple engine failure, hostile fire, injury to passenger or aircrew member, etc. This list is not all exhaustive. Most events require C2 agents to forward OPREP reports to higher headquarters. In all cases, pass the who, what, when, where, why, and how of the incident to a C2 agency.

8.5.6.1. The Spectrum Interference Resolution Program, covered in AFI 10-707, *Spectrum Interference Resolution Program*, establishes procedures to combat the effect of meaconing, intrusion, jamming, and interference. PICs who encounter electromagnetic interference (EMI) will report the event to the nearest C2 agency as soon as practical.

8.5.6.1.1. Address EMI reports to: HQ AMC SCOTT AFB IL//A63// and addressees listed in AFI 10-707. Send reports via electronic message format with the following information in plain text:

8.5.6.1.1.1. Frequency selected when EMI occurred.

8.5.6.1.1.2. Equipment affected by EMI. Location of the system. The system function, name, nomenclature, manufacturer with model number or other system description. The operating mode of the system, if applicable (frequency agile, pulse doppler, search, etc.).

8.5.6.1.1.3. Description of EMI (noise, pulsed, continuous, intermittent, on so forth).

8.5.6.1.1.4. Effect EMI had on system performance (reduced range, false targets, reduced intelligibility, data errors, etc.).

8.5.6.1.1.5. Date(s) and time(s) of EMI.

8.5.6.1.1.6. Location where EMI occurred (coordinates or line of bearing, if known, otherwise state as unknown.)

8.5.6.1.1.7. Source of the EMI if known.

8.5.6.1.1.8. List other units that received interference (if known) and their location or distance and bearing from your location.

8.5.6.1.1.9. A clear, concise narrative summary on what you know about the EMI, with any actions taken to resolve the problem.

8.5.6.1.1.10. Whether or not PIC wants expert/technical assistance (include level of security clearance expert requires).

8.5.6.1.1.11. Specify impact the EMI had on your mission.

8.5.6.1.1.12. Provide a POC (Name, Rank, DSN/Commercial Phone Number, and Duty hours).

8.5.6.1.2. C2 agents must prepare an OPREP-3 if EMI is suspected meaconing, intrusion, or jamming, interference sufficient to cause a hazard, or if, in the PIC's judgment, the situation warrants such a report.

8.5.6.1.3. PICs shall serve as classification authority for EMI reports. Evaluate an adversaries' ability to exploit certain systems using EMI and protect information accordingly. PICs on a non-sensitive mission or who judge the EMI to be interference from a non-hostile source need not classify EMI reports unless that report would reveal system vulnerability. PICs must classify interference report(s) at stations located in combat areas or during sensitive military missions.

8.6. Petroleum, Oil, and Lubricants (POL) - Aviation Fuels Documentation. This section prescribes aviation POL (AVPOL) procedures that ensure correct documentation, form and invoice processing, and program supervision. Reference DESC-I-31, *Purchase of Aviation Fuel and Services at Commercial Locations*. (<http://www.desc.dla.mil/dcm/files/desc-i-31.doc>) Use the Multi Service Corporation (MSC) air card for the purchase of aviation fuel and ancillary ground services at commercial airports (and some military installations) worldwide. The air card is authorized for use by all U.S. government aircraft, state, and local law enforcement aircraft, and some foreign government aircraft. All PICs should plan to use the platinum MSC card. In most cases, there will be no changes when refueling at non-Defense Energy Support Center (DESC) contract locations. The MSC card is accepted at approximately 4,800 locations worldwide. A list of all MSC-accepting merchants can be found at <https://www.airseacard.com>. It replaces the Standard Form (SF) 44, *Purchase Order-Invoice-Voucher*, at locations that accept the MSC card.

8.6.1. Responsibilities. Aircrew and maintenance personnel will be familiar with AVPOL procedures and documentation requirements of this chapter. Improper use of the MSC card could create financial liability for the purchaser.

8.6.2. Refuel/defuel USAF aircraft at DoD locations whenever possible. If DoD service is not available, purchase fuel from other source(s) in the following priority:

8.6.2.1. Defense Fuel Supply Center (DFSC) or Canadian into-plane contracts.

8.6.2.2. Foreign government air forces.

NOTE: DoD FLIP en route supplements identify locations with into-plane contracts.

8.6.3. AVPOL Forms Documentation and Procedures.

8.6.3.1. The DD1898, **Fuel Sale Slip**, is the fuel transaction receipt used for purchases at other DoD locations, including DFSC into-plane contract locations. Log and place the DD1898 inside the AF IMT 644. The PIC or designated representative shall complete this form. **NOTE:** If the contractor insists on a unique invoice along with the DD1898, annotate the vendor's invoice with "DUPLICATE DD1898 ACCOMPLISHED."

8.6.3.2. The AF IMT 664, **Aircraft Fuels Documenting Log**, is a tool to log and store all AVPOL transaction forms. Record all off-station transactions on the front of the form and insert the original form inside the envelope. Turn in the AF IMT 664, with supporting forms, to maintenance debriefing or as directed by local procedures. The PIC or designated representative shall complete this form when appropriate.

8.6.3.3. The SF 44, **Purchase Order-Invoice-Voucher**, may be used to purchase fuel, ground services and/or other authorized products when no MSC card contract is in place.

8.6.3.3.1. SF 44 fuel purchases where FBO agrees to invoice DESC for payment.

8.6.3.3.1.1. The aircrew shall present the SF 44 as the purchase invoice when an FBO refuses to accept the MSC card. The aircrew shall complete the SF 44 and attach it to the FBO vendor ticket/invoice when the FBO also declines use of the SF 44 and uses its own invoice/receipt. Fuel purchases shall be documented on a separate SF 44 from ground services and other authorized products since the FBO must invoice DESC for the fuel and the customer for non-fuel product and services.

8.6.3.3.1.2. Copies 1 and 2 of the SF 44 shall be provided to the FBO. Copy 1 of the SF 44 and one copy of the FBO commercial invoice, if applicable, shall be forwarded to the following address by the FBO to bill/invoice DESC: DESC-RRF, Building 1621-K, 2261 Hughes Avenue, Suite 128, Lackland AFB, Texas 78236.

8.6.3.3.1.3. Copy 3 of the SF 44 and one copy of the FBO commercial invoice, if applicable, shall be provided to the aircrew. Log and place a copy inside the AF IMT 664. Aircrews shall present all fuel purchase receipts to the designated aviation squadron Certifying Official and/or Accountable Official upon return to home station to enable timely validation and financial obligation processing into the Fuels Automated System (FAS).

8.6.3.3.2. SF 44 fuel purchases where the FBO requires cash payment.

8.6.3.3.2.1. Cash fuel purchases are only authorized when either the DOD 4500.54G, *DoD Foreign Clearance Guide*, requires cash payment, or when FBO locations outside the United States and U. S. Territories refuse MSC card and/or SF 44 invoicing processes. Aircrews required to pay cash for aviation fuel purchases shall employ the following procedures (**NOTE:** these procedures do not apply to non-fuel products or services):

8.6.3.3.2.1.1. The aircrew shall obtain cash from a local DoD Finance source that is charged to an approved Treasury suspense account prior to home station departure.

8.6.3.3.2.1.2. Aircrews shall complete the SF 44 and obtain the FBO fuel vendor annotation in block 11 of the SF 44 to confirm total cash amount and also sign and date the SF 44 blocks 20 and 21. Log and place a copy inside the AF IMT 664. Aircrew shall return unused cash to their local DoD Finance source upon return to home station. Present the completed SF 44 (for non-fuel charges only) to the appropriate home station administrative personnel for processing (e.g., Wing Refueling Document Control Officer, Finance Office, etc.)

8.6.3.3.3. SF 44 purchases of ground services and other approved products (not fuel).

8.6.3.3.3.1. Complete a separate SF 44 for non-fuel purchases. Provide the FBO copies 1 and 2 of the SF 44. The FBO shall use copy 1 and one copy of the FBO commercial invoice, if applicable, to directly bill/invoice the purchasing organization. Block 9 of the SF 44 shall reflect the organization name and address of the finance office responsible for payment to the FBO. The purchasing organization shall make payment to the FBO upon receipt of the invoice from the FBO. Log and place a copy inside the AF IMT 664.

8.6.3.3.4. If the vendor presents their own form for signature and accepts the SF 44, write the statement "SF 44 Executed" on the vendor's form.

8.6.3.3.5. Turn in two copies of the SF 44 to the operations officer at home station.

8.6.3.3.6. Present the aircraft identaplate for purchases at SITCO Agreement locations. Make certain the invoice includes date of transaction, grade of product, quantity issued/defueled, unit of measure, and signature of Air Force member who accepted product. If vendor also requires completed SF 44 write statement, "AF FORMS EXECUTED on vendor's invoice. Log and place a copy inside the AF IMT 664.

8.6.3.4. Purchasing Aviation Fuel in Canada. The DoD and Canadian Department of National Defense have signed a memorandum of understanding allowing DoD aircraft to use the DD1896, **Jet Fuel Identaplate**, when refueling at Canadian airfields with a Canadian National Defense Contract (CNDC). Use the AIR for fuel purchases at Canadian airports without a CNDC, and for ground handling services at all Canadian airports.

8.6.3.5. Use host country forms to effect purchases at foreign military airfields, including replacement-in-kind locations. Hand scribe information from aircraft identaplate on the local form. Log and place a copy inside the AF IMT 664,.

8.7. Not Used.

8.8. AMC Form 54, Aircraft Commander's Report on Services/Facilities. The AMC Form 54 is a tool to report level of excellence for services encountered during mobility operations. Be quick to identify

outstanding performers and attempt to resolve problems at lowest level practical. PICs should advise affected agency on their intent to submit an AMC Form 54. Provide a copy of the completed form to local station AMC C2 agency. Upon return to home station, PICs will coordinate form with SQ/CC and OG/CC. For Forms 54 that require AMC coordination, OG/CCs shall review and submit AMC Form 54 to 18AF/CC.

8.9. AMC Form 196, Aircraft Commander's Report on Crew Member. The AMC Form 196 is a tool to document an aircrew member or mission essential ground personnel's outstanding, below average, or unsatisfactory performance during a mobility mission. Be quick to identify outstanding performers and attempt to solve problems at lowest level practical (provide local senior leaders opportunity to resolve problems as they occur). Send the report to subject's unit commander.

8.10. AMC Form 43, Transient Aircrew Facilities Report. The AMC Form 43 is a tool to report level of excellence for transient facilities. Any crewmember may submit this report whether or not the PIC includes an unsatisfactory item in the trip report. Send completed AMC Form 43 to HQ AMC/MWPS, or MAJCOM equivalent.

8.11. Not Used.

8.12. Not Used.

8.13. AF 4096, Airdrop/Tactical Airland/Air Refueling Mission Recap, SKE/ZM Debrief, is a tool to document details of airdrop, tactical airland, AR, or station keeping equipment (SKE)/zone marker (ZM) missions. PIC or designated representative shall complete AF 4096 (or command supplement) and submit same to home-station tactics office.

Chapter 9

TRAINING POLICY

9.1. Passengers on Training Missions.

9.1.1. Carrying of passengers during initial or re-qualification training will be IAW with AFI 11-401 and this instruction.

9.1.2. Mission qualification training, en route evaluations, off station trainers, line development missions, and JA/ATTs may be conducted on missions with passengers provided the individual in training is qualified (completed aircraft evaluation with a valid AF Form 8).

9.1.2.1. If passengers are onboard, touch-and-go landings and Night Vision Goggle (NVG) training are prohibited. (This does not apply to MEGP.)

9.1.3. Multiple practice approaches will not be accomplished with passengers.

EXCEPTION: When approved by the MAJCOM/A3, maintenance and civilian employees, under direct contract to the DoD and engaged in official direct mission support activities, considered mission essential may be onboard when touch-and-go or stop and-go landings are performed providing the mission is a designated training flight and an IP or EP is in command.

9.2. Touch-and-go Landing Limitations.

9.2.1. Touch-and-go landings will only be accomplished under the direct supervision of an IP.

9.2.2. Limitations.

9.2.2.1. Comply with all flight manual restrictions and procedures to include performance degradation with fuel, cargo limits, etc.

9.2.2.1.1. Flap operations IAW **paragraph 5.5.**

9.2.2.2. Minimum runway length: 7000-feet. Minimum runway width: 150-feet.

9.2.2.3. Minimum ceiling/visibility: 300 feet and RVR 40 (3/4 SM visibility).

9.2.2.4. RCR shall be 12 or higher.

9.2.2.5. Do not accomplish touch-and-go landings on slush covered runways.

9.2.2.6. Maximum takeoff and landing crosswind component, corrected for RCR, may not exceed flight manual limitations. Do not exceed the normal zone of the runway wind and crosswind component chart.

9.2.3. Touch-and-go landings may be performed with cargo on board provided:

9.2.3.1. T.O. 1C-5A-1 normal landing weight is not exceeded.

9.2.3.2. Cargo security is checked prior to the first touch-and-go and thereafter at an interval determined by the loadmaster (not to exceed 1 hour). PICs must coordinate with the loadmaster and allow additional time for this inspection.

9.2.3.3. Hazardous cargo is not acceptable. **EXCEPTION:** Home station touch-and-go training may be accomplished with diesel powered vehicles on board provided the only listed hazard is engine internal combustion.

9.3. Training on Operational Missions.

9.3.1. Crews may perform multiple approaches and touch-and-go landings on operational airlift (TWCF) and 618 TACC directed missions provided the following requirements are met:

9.3.1.1. Normal touch-and-go limitations apply and MEGPs are briefed of the activity.

9.3.1.2. All transition training will be accomplished during the first 12 hours of the FDP only.

9.3.1.3. Pre-mission coordination requirements. Activity shall be approved by TWCF/618 TACC tasking authority and unit training is charged to unit. As part of pre-mission planning, PICs will contact parent wing current operations and obtain training mission number(s) for use at each en route location(s) where training events are planned. In addition, PICs will coordinate with and receive approval from unit OG/CC and the airfield(s) where training is to be accomplished. They will then coordinate with the 618 TACC to ensure adequate ground time is available at planned training locations to allow for planned training events, clearing customs, required crew rest, etc. Once complete, wing current operations will coordinate with 618 TACC to re-cut the mission and add the training mission number(s) in GDSS/C2IPS.

9.3.1.4. Upon initial arrival at the training location, close out the current line on the AFTO 781 and log the training time on the next line using the appropriate training mission symbol and number.

9.3.2. Crews may accomplish aerial refueling training on operational missions provided applicable items of **9.3.1.3.** and the following requirements are met:

9.3.2.1. A qualified AC (or higher) must on-load all mission-required fuel prior to commencing any training.

9.3.2.2. Passengers and MEGPs are briefed on the activity.

9.4. Simulated Emergency Flight Procedures.

9.4.1. Simulated emergency flight procedures will be conducted IAW AFI 11-202V3 and this instruction.

9.4.2. Simulated emergencies may be practiced only during training, evaluation, or currency flights when an instructor or evaluator pilot is in one of the pilot seats. IP candidates in a pilot seat and under the supervision of an EP not in a pilot seat may practice simulated emergency procedures during initial or requalification upgrade evaluations to IP. Except for practice breakaways, simulated emergency procedures are prohibited during air refueling.

9.5. Flight Pilot/Copilot Training.

9.5.1. FPs that completed the MPD syllabus may practice air refueling from the left seat (to include the contact position) with the following restrictions:

9.5.1.1. Accomplished under direct IP (aerial refueling qualified) supervision.

9.5.1.2. No passengers are authorized.

9.5.1.3. Contacts by non-AR qualified pilots will only be made after receiving acknowledgment from the tanker pilot and boom operator. The boom operator must be fully qualified. (N/A during FTU training provided the boom operator is under direct instructor supervision.)

9.5.2. An FP may perform any tactical maneuver, to include tactical descents and landings, under the direct supervision of an IP.

9.6. Night Vision Goggle (NVG) Training.

9.6.1. Accomplish aircrew training according to AFI 11-2C-5V1 and MAJCOM approved training guide before NVG use. NVG Airland approaches and landings may be flown from either seat.

9.6.1.1. Touch-and-go Operations. The pilot flying will maintain runway alignment. The PM will execute flight manual procedures. The jumpseat position will back-up the pilot flying on throttle setting. Use of the Go-Around Attitude Subsystem (GAAS) is recommended. During acceleration and takeoff, the PM should monitor outside as the pilot flying transitions from outside references to instruments.

9.6.1.2. FP qualified pilots and MPD graduates with 700 hours are authorized to enter initial NVG training. NVG certification will be accomplished when the individual is certified as a MP. FPs may accomplish NVG landings under the direct supervision of an IP and an NVG Certified Pilot occupies the jumpseat.

9.6.1.3. Not used.

9.6.1.4. Takeoff and Landing Restrictions.

9.6.1.4.1. Maximum crosswind component is 15 knots.

9.6.1.4.2. Both pilots' RA and one GPS must be operational.

9.6.1.4.3. Both IR covered landing lights must be operational.

9.6.1.4.4. An NVG-qualified crewmember acting as safety observer is required for initial pilot upgrades.

9.6.1.4.5. NVG touch-and-go landings are authorized. The minimum runway required for a NVG touch-and-go is 8,000 ft.

9.6.1.4.6. Runway must be lit with an authorized covert lighting pattern.

9.7. Prohibited In-Flight Training Maneuvers.

9.7.1. Simulated engine out takeoffs.

9.7.2. Approach to stalls and full stalls.

9.7.3. Dutch rolls.

9.7.4. Simulated runaway pitch trim malfunctions.

9.7.5. Simulated two engines out landings and missed approaches.

9.7.6. Jammed Stabilizer.

- 9.7.7. Landing with inoperative hydraulic systems.
- 9.7.8. RAT deployment.
- 9.7.9. In-flight gear kneeling.
- 9.7.10. No-slat landing.
- 9.7.11. Minimum run landings.
- 9.7.12. Steep turns (over 45 degrees of bank).
- 9.7.13. Rejected takeoffs.
- 9.7.14. Unusual attitudes.
- 9.7.15. Emergency descents.
- 9.7.16. Emergency boom latching.
- 9.7.17. Reverse air refueling.
- 9.7.18. PACS off landing.
- 9.7.19. Simultaneous simulated engine failures and no flap approach training.

9.8. Instructor Pilot Briefing. Before all training/evaluation missions, aircraft commanders or instructors/flight examiners should brief their crew on the following additional items:

- 9.8.1. Training/Evaluation requirements. Instructors/evaluators (for each crew position) will outline requirements and objectives for each student or examinee. Brief the training objectives IAW AMC C-5 Aircrew Training System syllabus.
- 9.8.2. Planned training area and seat changes.

9.9. Debriefing. Review and evaluate overall training performed. Each student or aircrew member should understand thoroughly what training has been accomplished. Ensure all training is documented.

9.10. Simulated Instrument Flight. Artificial vision restricting devices are not authorized for any phase of flight. Simulated instrument flight may be flown and logged without the use of a vision-restricting device.

Table 9.1. Training Flight Restrictions.

Maneuver	Altitude	Remarks
Instrument Missed/low approaches	MDA/DH	Initiate practice instrument missed approaches no lower than the minimum altitude for the type of approach executed.
Simulated Engine Failure	(One throttle at idle) Initiate above 500 feet AGL	Simulated engine failures are not authorized at less than 2-engine V_{mca} . Simulated engine failure will not be practiced when any actual emergency exists, during no-flap landings, or during practice category II ILS approaches. Simulate use of "MIN Q."
Go-Around and Missed Approach		
All Engines	Initiate above 100 feet AGL	IPs and EPs shall not plan to initiate a go-around or missed approach below 100 feet AGL.
3 engines	Initiate no lower than 200 ft AGL	Use all engines if initiated below 200 feet AGL.
Men and equipment on runway	Initiate above 500 ft AGL	
No-flap approach	N/A	Full-stop landing only. 15 knot maximum crosswind component. Maximum gross landing weight 525,000 pounds. Landings may be performed on training, evaluation, and currency flights.

9.11. Category II ILS Training. Flight training and evaluation may be conducted using any ILS where signal output is accurate and stable enough to achieve the desired training.

9.11.1. Weather. No lower than 200 feet/ 2400 RVR (visibility mile).

9.11.2. Winds. Maximum crosswind component of 15 knots.

9.11.3. When a category II decision height is not published, DH for training will be based on a height above terrain of 100 feet.

9.11.4. Do not combine with no-flap approach.

9.12. Manual Gear Lowering. For training purposes, manual lowering of landing gear may be demonstrated to simulate an electrical power failure that would require manual actuation and override of normal landing gear selector valves. Procedures in section 3 of T.O. 1C-5A-1 will be followed with the following exceptions:

9.12.1. Control circuit breakers for the gear to be manually extended will be opened prior to initiating the emergency extension checklist.

9.12.2. Landing gear emergency extend switches located on the control pedestal will not be used for practice emergency extension.

NOTE: All training objectives pertaining to emergency extension of the gear using emergency extend switches can be accomplished in the simulator.

Chapter 10

AIRCREW OPERATIONS IN CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR, AND HIGH-YIELD EXPLOSIVE THREAT ENVIRONMENT

10.1. Overview. The proliferation of Chemical, Biological, Radiological, Nuclear, and High-Yield Explosive (CBRNE) weapons and the means to deliver them present serious security threats to the global operations of air mobility forces. This chapter describes the CBRNE threat, passive defense measures to mitigate that threat, and guidance for ground and flight operations in a contaminated environment.

10.2. Understanding the CBRNE Threat.

10.2.1. Chemical Weapons. Militarily significant chemical weapons include nerve, blister, choking, and blood agents. A key point for aircrew members to remember is that time is on your side. The ultra-violet (UV) rays of the sun, high temperatures, and high absorption rates of chemicals all decrease their lethality. Most chemical agents will either evaporate or absorb into surfaces. For decontamination, cleaning with hot soap and water and/or a 5 percent bleach solution currently appears to be the best and most practical method of removing chemical agents that may remain as a contact hazard on glass, and unpainted metal. Currently, the only decontaminant authorized for use on aircraft is soap and water. **NOTE:** Recent tests indicate that as a decontaminated aircraft dries, the absorbed chemical warfare agent (CWA) may resurface from painted surfaces causing contact and vapor hazards.

10.2.2. Biological Weapons. Biological warfare agents (BWA) are normally divided into three areas: bacteria (i.e., Anthrax) that live outside the cell, reproduce, and are normally susceptible to antibiotics; toxins (i.e., Ricin), that are poisons produced by living organisms or plants; and viruses (i.e., Smallpox) that normally require the host of a living cell to survive and reproduce. Viruses and toxins do not respond to antibiotics. It is probable that the medical community would be the first to recognize that an upsurge in flu-like symptoms is actually a bio attack. Although BWA are degraded by UV rays, humidity and high/low temperatures, some BWA (i.e., Anthrax spores) may have a long life, lasting decades under the right conditions. Current immunizations and good personal hygiene help prevent infection.

10.2.3. Radiological Weapons. The radiation dispersal device (RDD), or so-called dirty bomb, is the typical radiological weapon. RDD is any device that disseminates radioactive material without using a nuclear detonation. Key points to remember are that shielding and distance are the best defenses against radiation exposure.

10.2.4. Nuclear Weapons. The threat from a nuclear device is from the initial blast, heat, and radiation and residual fallout. In addition, the Electromagnetic Pulse (EMP) from a nuclear detonation can damage electronic equipment. The best protection is a combination of shielding, distance from the blast, and limited time of exposure.

10.2.5. High-Yield Explosives. High-yield explosives are conventional weapons or devices that are capable of a high order of destruction or disruption. Passive defense measures include hardening of facilities and establishing stand-off distances for personnel and key assets.

10.3. CBRNE Passive Defense Measures. Passive defense measures are those activities conducted to negate, contain, and manage the effects of CBRNE attack. Passive defense measures include pre, trans,

and post-attack actions designed to mitigate the CBRNE threat through contamination avoidance, protection, and contamination control.

10.3.1. Contamination Avoidance. Contamination avoidance is the most important passive defense measure. Techniques for contamination avoidance include: inflight diversion, survival launch, and minimizing exposure to contaminated cargo, aerospace ground equipment (AGE), and material handling equipment (MHE).

10.3.1.1. Inflight Diversion. When advised that a destination airfield is under CBRNE attack or has been contaminated, the aircrew will divert to an uncontaminated airfield, if at all possible. Authority to land at a contaminated airfield will be specified in the controlling OPOD.

10.3.1.2. Survival Launch. If caught on the ground during attack warning, every reasonable effort will be made to launch to avoid the attack. Upon proper clearances, aircrew may launch to survive if they have sufficient fuel and unrestricted, safe access to the runway. In practice, this option may only be practical for aircraft that have just landed or aircraft at or near the end of the runway. If launch is not possible, shut down engines and avoid running environmental control systems. Close aircraft doors/hatches/ramps, don Individual Protective Equipment (IPE), and seek personal protective cover on the base. If time does not permit using base facilities, and the attack is a missile attack, remain in the sealed aircraft for a minimum of one-hour after the attack and/or follow host-base direction.

10.3.1.3. Avoiding Cross Contamination from AGE, MHE, and Cargo. All formerly contaminated equipment and cargo must be marked to facilitate contamination avoidance and the use of protective measures. Additionally, the air shipment of formerly contaminated cargo requires special precautions and must be specifically authorized by the senior transportation commander.

10.3.2. Protection. When exposure to chemical and/or biological agents cannot be avoided, protection provides the force with the ability to survive and operate in a CBRNE environment. Protection is afforded by individual protective equipment, collective protection, and hardening of facilities.

10.3.2.1. Individual Protective Equipment. The current in-flight protective gear for aircrew members is the Aircrew Chemical Defense Ensemble (ACDE). The ACDE includes the newer Aircrew Eye-Respiratory Protection System (AERPS) above the shoulders and the CWU-66/P or CWU-77/P Integrated Aircrew Chemical Coverall (IACC). The Ground Crew Ensemble (GCE) consists of the protective mask, C2 series canister (or filter element for MCU-2A/P protective mask), and over garment, boots, and gloves. The ACDE and GCE provide protection against chemical and biological agents. They do not provide blast or radiation protection from an RDD or nuclear detonation. The ACDE requires care during donning using "buddy dressing" procedures and Aircrew Life Support (ALS) expertise during processing through the Aircrew Contamination Control Area (ACCA). **NOTE:** AECMs will utilize the MCU-2A series mask.

10.3.2.1.1. ACDE/GCE Issue. Aircrews will be issued sized ACDE and GCE at home station. Aircrews will ensure their ACDE and GCE are available at all times while in a CBRNE threat area. Aircrew members will confirm the mobility bag contents and correct sizes.

10.3.2.1.2. ACDE Wear During Ground Operations. Because aircraft contamination is unlikely to occur during flight, ground operations represent the highest threat to aircrew safety. Protection from enemy attacks and exposure to liquid chemical agents is paramount. Aircrew should limit activities to essential duties only, and separate ground duties from air duties.

10.3.2.2. **Collective Protection.** Collective protection provides a temperature-controlled, contamination-free environment to allow personnel relief from continuous wear of IPE such as the ACDE. The basic concept for most facility collective protective solutions is to employ overpressure, filtration, and controlled entry/exit. The intent is to provide rest and relief accommodations, as well as provide medical treatment in contamination free zone.

10.3.2.3. **Hardening.** Permanent and expedient hardening measures are used to strengthen buildings and utility systems or provide barriers to resist blast effects. To reduce the potential of vapor exposure in facilities without collective protection seal windows and doors, turn off HVAC systems and use rooms above the first floor whenever possible.

10.3.3. **Contamination Control.** In the post-attack environment, contamination control measures limit the spread of chemical, biological, and radiological contamination through disease prevention measures, decontamination, and use of Exchange Zone (EZ) operations. Effective contamination control helps sustain air mobility operations by minimizing performance degradation, casualties, or loss of material.

10.3.3.1. **Disease Prevention.** Up-to-date immunizations, standard personal hygiene practices, and the use of chemoprophylaxis are effective biological warfare defensive measures.

10.3.3.2. **Decontamination.**

10.3.3.2.1. **Inflight Decontamination.** Air washing is a useful inflight decontamination technique for removing most of the liquid agent from aircraft metal surfaces. However, vapor hazards may remain in areas where the airflow characteristics prevent complete off-gassing (i.e., wheel wells, flap wells, rivet and screw heads, joints, etc.). Flights of at least 2 to 4 hours are recommended, and lower altitudes are more effective than higher altitudes. Fly with the aircraft configured (gear, flaps, and slats extended) as long as possible to maximize the airflow in and around as many places as possible. Be advised that exterior contamination may seep into the aircraft interior creating a vapor hazard for aircrews. Use of ACDE is recommended. Follow smoke and fume elimination procedures to help purge interior contamination.

10.3.3.2.2. **Limits of Decontamination.** Complete decontamination of aircraft and equipment may be difficult, if not impossible, to achieve. Formerly contaminated assets will be restricted to DOD-controlled airfields and not released from US government control.

10.3.3.3. **Exchange Zone (EZ) Operations.** The AMC Concept for Air Mobility Operations in a Chemical and Biological Environment (CB CONOPS) describes a method for continuing the vital flow of personnel into a contaminated airfield while limiting the number of air mobility aircraft and personnel exposed to the contaminated environment. The purpose of the EZ is to minimize the spread of contamination within the air mobility fleet, preserving as many aircraft as possible for unrestricted international flight. The EZ is an area (located at uncontaminated airfield) set aside to facilitate the exchange of uncontaminated (clean) cargo/passengers to a contaminated (dirty) airframe, or visa versa, without cross-contamination. Additional information on the EZ is available through HQ AMC/A35.

10.4. Flight Operations.

10.4.1. **Mission Planning.** Aircrews must be mentally prepared to face the dangers of CBRNE weapons. Flight/mission planning must be thorough. Aircraft commanders should emphasize ACDE wear, crew coordination, CBRNE hazards and countermeasures, inflight diversion, plans for onload/offload

in the event of a ground attack, and plans for the return leg in the event of aircraft contamination. Alternative scenario plans should also be considered in the event mission-oriented protective posture (MOPP) conditions change.

10.4.2. Establishing the Threat Level. Aircrews should monitor command and control channels to ensure they receive the latest information concerning the destination's alert condition. Diversion of aircraft to alternate "clean" locations may be required, unless operational necessity otherwise dictates. The 618 TACC or theater C2 agencies (normally through the controlling OPORD) will direct aircrew pre-exposure activities such as medical pre-treatment for chemical/biological exposure or issue of dosimeter for potential radiological hazards.

10.4.3. Fuel Requirements. Extra fuel may be needed to compensate for altitude restrictions as the result of CB agent exposure. During purge periods, the aircraft will be unpressurized. Although the aircrew can use the aircraft oxygen systems, passengers wearing GCE cannot, thus restricting the aircraft cruise altitude and increasing fuel requirements accordingly.

10.4.4. Oxygen Requirements. Operating a contaminated aircraft will increase oxygen requirements. Aircrew wear of ACDE will require use of the aircraft oxygen system to counter actual/suspected contamination. Using the 100 percent oxygen setting offers the greatest protection in a contaminated environment. Appropriate oxygen reservoir levels must be planned to meet higher consumption rates. Use the aircraft Dash 1 charts to calculate the required reservoir levels.

10.4.5. Donning Equipment. Aircrew will don ACDE based on the alarm condition (See Airman's Manual (AFMAN 10-100). Use the "buddy dressing" procedures, and refer to, AMCV 11-303 and AMCV 11-304 to ensure proper wear. When wearing the ACDE, Atropine and 2 PAM Chloride auto injectors will be kept in the upper left ACDE pocket. If the integrated survival vest/body armor is worn, the Atropine and 2 PAM Chloride auto injectors may be kept in the lower right flight suit pocket. This standardized location will enable personnel to locate the medication should an individual be overcome by CWA poisoning. M-9 paper on the flight suit will facilitate detection of liquid chemical agents and ACCA processing. M-9 paper should be placed on the flight suit prior to entering the CBRNE threat area or when an alarm "yellow" or higher has been declared. When inbound to a CBRNE threat area, prior to descent, the aircraft commander will ensure crew and passengers don appropriate protective equipment IAW arrival destination's MOPP level and brief aircrew operations in the CBRNE threat area. As a minimum, this briefing will include: flight deck isolation, oxygen requirements, air conditioning system requirements, IPE requirements, ground operations, and MOPP levels. Aircrew members must determine if the wear of the integrated survival vest/body armor and LPUs will restrict dexterity and mobility to the point that it becomes a safety issue. If the aircrew deems the equipment to create a safety of flight concern, then the items may be pre-positioned (instead of worn) on the aircraft to be readily available to the aircrew.

10.4.6. Communicating Down-line Support. Pass aircraft and cargo contamination information through command and control channels when inbound. This information will be used to determine if a diversion flight is required or decontamination teams are needed. Report the physical condition of any crew/passengers who are showing agent symptoms and whether they are wearing chemical defense ensembles.

10.5. Ground Operations.

10.5.1. Crew Rest Procedures. Operational necessity may require the aircrew to rest/fly in a contaminated environment. If the mission is not being staged by another aircrew or pre-flight crews are not available, the aircrew may pre-flight, load, and secure the aircraft prior to entering crew rest. The departing aircrew will perform necessary crew preparations and pre-flight briefings. Then, they will report to the ACCA for processing and ACDE donning with assistance from ALS personnel. If possible, aircrew transport should be provided in a covered vehicle. Aircrews should avoid pre-flying the aircraft prior to departure to prevent contamination spread to them and/or the aircraft. As aircrews proceed to fly, they will require assistance from ground support personnel in removing their aircrew protective overcape and overboots prior to entering the aircraft.

10.5.2. Onload and Offload Considerations. Extreme care must be exercised to prevent contamination spread to the aircraft interior during ground operations, particularly to the flight deck area. Reduce the number of personnel entering the aircraft. Contaminated engine covers, safety pins and chocks will not be placed in the aircraft unless sealed in clean plastic bags and properly marked IAW technical order requirements. Aircrew members entering the aircraft will remove plastic overboots and overcape portions of the aircrew ensemble and ensure flight/mobility bags are free of contaminants and placed in clean plastic bags. Prior to entering the aircraft all personnel should implement boot wash/decontamination procedures. Aircrew exiting aircraft into a contaminated environment will don plastic overboots and overcape prior to leaving the aircraft.

10.5.3. Communications. Conducting on/offloading operations, while wearing the complete ACDE, complicates communications capability. Use the mini-amplifier/speaker or the aircraft public address system and augment with flashlight and hand signals, as required.

10.5.4. Airlift of Retrograde Cargo. Only CRITICAL retrograde cargo will be moved from a contaminated to an uncontaminated airbase. Critical requirements are pre-designated in theater war plans. Onload cargo will be protected prior to and while being transported to the aircraft. If contaminated, protective cover(s) will be removed/replaced just prior to placing the cargo on the aircraft. It is the user's responsibility to decontaminate cargo for air shipment. The airlift of contaminated or formerly contaminated cargo requires the approval of the senior transportation commander.

10.5.5. Passenger/Patients. A path should be decontaminated between the aircraft and the ground transportation vehicle to reduce interior contamination when loading/unloading passengers/patients. Normally, externally contaminated patients and those infected with contagious biological agents will not be transported onboard AMC or AMC-procured aircraft. The AMC/CC is the waiver authority to this policy. **NOTE:** An altitude below 10,000 feet is recommended due to AECM use of the ground chemical mask.

10.5.6. Physiological Factors. Aircraft commanders must be very sensitive to the problems resulting from physical exertion while wearing ACDE. The aircraft commander should consider factors such as ground time, temperature and remaining mission requirements when determining on/offload capabilities. Individuals involved should be closely monitored for adverse physiological effects.

10.5.7. Work Degradation Factors. Work timetables need to be adjusted to minimize thermal stress caused by wearing the ACDE. Aircrews must weigh all factors when performing in-flight and ground duties. The following are degradation factors for wearing full GCE, and may also be used to represent the Task Time Multipliers for the ACDE. A more extensive discussion of this subject is found in AFMAN 32-4005, *Personnel Protection and Attack Actions*.

Table 10.1. Task Time Multipliers

Work Rate	Temperature		
	20-49 F	50-84 F	85-100 F
	-6 to 9 C	10 to 28 C	29 to 38 C
Light	1.2	1.4	1.5
Moderate	1.3	1.4	3.0
Heavy	1.7	2.1	5.0

10.5.8. Outbound with Actual/Suspected Chemical Contamination. Once airborne with actual/suspected vapor contamination, the aircraft must be purged for 2 hours using Smoke and Fume Elimination procedures. To ensure no liquid contamination exists, a close inspection of aircrew, passenger ensembles, and cargo will be conducted using M-8 and M-9 detection paper. Detection paper only detects certain liquid agents and will not detect vapor hazards. Above the shoulder ACDE should only be removed if there is absolutely no vapor hazard. Be advised that residual contamination (below the detectable levels of currently fielded detection equipment) may be harmful in an enclosed space. The aircrew must take every precaution to prevent spreading of liquid contaminants, especially on the flight deck area. The best course is to identify actual/suspected contamination, avoid those areas for the remainder of the flight, and keep the cargo compartments cool. If an aircrew member or passenger has been in contact with liquid contaminants, all personnel aboard the aircraft will stay in full ACDE/GCE until processed through their respective contamination control area (CCA). Upon arrival, the contaminated aircraft will be parked in an isolated area and cordoned to protect unsuspecting ground personnel.

10.5.9. Documenting Aircraft Contamination. When it is suspected or known that an aerospace vehicle or piece of equipment has been contaminated with a radiological, biological or chemical contaminant, a Red X will be entered and an annotation will be made in historical records for the lifecycle of the equipment.

10.5.10. 10-Foot Rule. The 10-foot rule was developed in order to provide guidance for protecting personnel using or handling contaminated resources (such as pallets) or working in locations with materials that might retain a residual chemical. The 10-foot rule embodies a safety factor that goes beyond current OSD guidance (which allows removal of IPE whenever detectors no longer detect a chemical agent vapor hazard). There are two phases associated with the 10-foot rule.

10.5.10.1. Initial Phase. During the initial phase, personnel will remain in MOPP 4 whenever they stay within 10 feet of the contaminated equipment for more than a few seconds. This MOPP level provides personnel the maximum protection from the chemical agent as it transitions from a contact and vapor hazard to a vapor hazard only.

10.5.10.2. Follow-on Phase. In the follow-on phase, personnel will use gloves (i.e. leather, rubber, cloth, etc.) when operating on or handling the contaminated equipment. Although a contact hazard is unlikely, relatively small amounts of the agent may still be present. The use of gloves will ensure that unnecessary bare skin contact with agent residue is avoided.

10.5.10.3. **Table 10.2.** shows times associated with initial and follow-on phases of the 10-foot rule. To simplify response processes, commanders may choose to use the worst case scenario as

the foundation for all 10-foot rule actions, i.e., 24 hours for the initial phase and all periods of time greater than 24 hours for the follow-on phase.

Table 10.2. Ten-Foot Rule Time Standards (Source: AFMAN 10-2602).

10 Foot Rule Time Standards*		
Agent	Initial Phase	Follow-on Phase
HD	0-12 HRS	Greater than 12 hrs
GB	0-12 HRS	Greater than 12 hrs
GD, GF, GA	0-18 HRS	Greater than 12 hrs
VX, R33	0-24 HRS	Greater than 24 hrs
* Rule is based on expected contamination on an airbase following a chemical attack. Adjust times if agent concentration is higher than expected.		

Chapter 11

NAVIGATION PROCEDURES

Section 11A—Aircrew Procedures

11.1. General. This chapter consolidates unique navigation procedures into one location.

11.2. Mission Planning.

11.2.1. The PIC or designated representative shall verify that proposed routes and flight altitudes and levels provide proper terrain clearance and meet FLIP and Foreign Clearance Guide requirements.

11.2.2. Pilots shall crosscheck the computer flight plan (CFP) route of flight against the route of flight entered on the DD 175, **Military Flight Plan**, DD 1801, **DoD International Flight Plan**, or ICAO flight plan.

11.2.3. If a CFP is out of date or not available and routing or meteorological information is desired, the PIC should obtain direct assistance from the 618 TACC flight planner or IFM. CFPs and CFP tracks to assist in manual flight planning are available with a current IMT account through the AMC Aircrew Portal.

11.3. Flight Charts.

11.3.1. Prior to flight, the PIC or designated representative shall plot oceanic portion of the flight on an appropriate chart (e.g. OPC, GNC, Jeppesen). Place the following information on the chart:

11.3.1.1. Mission number.

11.3.1.2. Preparer's and PIC's name.

11.3.1.3. Date.

11.3.1.4. Flight plan course depicting reporting points with proper names or coordinates.

11.3.1.5. On AR missions, plot the ARIP, ARCP, exit, and turn points.

11.3.2. Multiple legs on the same chart are permissible when practical.

11.3.3. Following mission completion, turn in applicable items: plotting charts, CFPs, and fuel planning calculations. Units will maintain these items as part of flight records for a minimum of 90 days.

11.4. Navigation Procedures.

11.4.1. Flight Progress.

11.4.1.1. General. When using INS/GPS as the primary means of navigation, use all available NAVAIDs to monitor INS/GPS performance and ensure compliance with course and ETA tolerance. On airways, INS/GPS may be coupled to the autopilot provided the applicable airway NAVAIDs are selected and monitored on the other HSI and BDHI.

11.4.1.2. Category I Routes. Use the following to monitor flight progress on Category I routes:

11.4.1.2.1. When possible, obtain a coast-out fix prior to or immediately upon entering the category I route segment. Plot the fix on the chart along with FMS/GPS Configured Steering

Solution using the procedures in AFTTP 3.3.35B, Table 4.1, *Category I Fixing*. For flights in RVSM airspace, record both altimeters.

11.4.1.2.2. When approaching each waypoint recheck the coordinates for the next two waypoints. Crosscheck aircraft heading with computer flight plan planned course and actual drift.

11.4.1.2.3. Ten (10) minutes after passing each oceanic waypoint or every 500 miles, record and plot the configured steering solution position(s) and time on the chart, and ensure compliance with course and ETA tolerances.

11.4.1.2.4. If a revised clearance is received, record and plot the new course on the chart.

11.4.1.3. Immediately report malfunctions or loss of navigation capability which degrades center-line accuracy to the controlling agency.

11.4.2. Inoperative Inertial Navigation Units. Use GPS position, if available, to cross check remaining INS positions to determine accuracy of remaining inertial navigation units. Continue INS/GPS navigation and verify actual navigation performance is RNP compliant.

11.4.2.1. One unit inoperative:

11.4.2.1.1. If the 10-nautical mile error annunciator light has not illuminated, proceed per normal operations, and fly off either INS.

11.4.2.1.2. Difference between INSs 10-20 NMs:

11.4.2.1.2.1. Monitor, check position using available NAVAIDs.

11.4.2.1.2.2. Attempt to establish which INS is most accurate. If unable to determine which INS is in error, split the difference.

11.4.2.1.3. Difference between INSs 20-40 NMs:

11.4.2.1.3.1. Comply with paragraph [11.4.2.1.2](#).

11.4.2.1.3.2. Check ground speed, wind, drift, and compare heading to CFP (this may provide a good indication of the faulty INS).

11.4.2.1.4. Difference between INSs over 40 NMs:

11.4.2.1.4.1. Comply with paragraphs [11.4.2.1.2](#) and [11.4.2.1.3](#).

11.4.2.1.4.2. Obtain winds and ground speed from nearby aircraft or ARTCC to help determine the most accurate INS.

11.4.2.1.4.3. Determine which INS is correct by checking which INS is following the CFP most closely and use it as primary.

11.4.2.2. Two units inoperative. In addition to the above guidance:

11.4.2.2.1. Continue to verify INS/GPS navigation remains RNP compliant.

11.4.2.2.2. Check the accuracy of the INS using all available NAVAIDs.

11.4.2.2.3. Advise ARTCC unless within range of normal radio aids.

11.4.2.3. Three units inoperative. In addition to above guidance:

11.4.2.3.1. Advise ARTCC.

11.4.2.3.2. Monitor compass heading.

11.4.2.3.3. Use CFP as a guide. If CFP has been in error prior to INS failure, request reanalysis from the weather support unit at 618 TACC.

11.4.2.3.4. Try to obtain an HF DF fix.

11.4.3. Navigation performance and vertical separation.

11.4.3.1. North Atlantic and US west coast or Hawaii route minimum navigation performance specifications (MNPS) are mandatory. Minimum equipment and contingency procedures are in FLIP AP/2.

11.4.3.2. Required navigation performance (RNP) RNAV (e.g., RNP-10) standards are increasingly being applied globally. Minimum equipment and navigation tolerances are in FLIP AP/3.

11.4.3.3. Reduced vertical separation minimums (RVSM) are mandatory when specified. Required equipment and contingency procedures are in FLIP GP.

11.4.4. Grid Operations. Operations above 70 degrees north and below 60 degrees south require thorough study and understanding of instrument approach procedures (IAP) and of INS procedures and heading displays. The PIC will decide whether headings will be magnetic, grid, or true oriented and ensure the other pilots understand what type heading is being displayed on the HSIs, BDHIs, and CDUs.

NOTE: Grivation (GV) shown on the IAP applies to other aircraft and will not be used for C-5 operations. IAPs above approximately 65 degrees north contain the following notice: Grid courses are true polar courses and convergence angle factor shall not be applied. Convergence angle factors apply to sub-polar navigation charts used by aircraft other than C-5 and must not be used. C-5s will use a convergence factor of 1.00000.

11.4.4.1. AR Rendezvous. Coordinate with the tanker to ensure a common heading reference is used.

11.4.5. Not used.

Section 11B—Low Altitude Navigation Procedures

11.5. General. This chapter provides mission planners and aircrews guidance necessary to plan and accomplish low altitude missions.

11.6. Mission Planning. See [Chapter 16](#) for planning procedures.

11.7. En Route Procedures.

11.7.1. Weather. The low altitude route must be flown in VMC. If IMC is encountered, maneuver over or around the weather, or abort the mission. The primary procedure is to change course as required to avoid IMC. The secondary procedure is to climb over the weather. If unable to maintain VMC, immediately execute a climb to the minimum safe altitude (MSA), turn IFF, to emergency, declare an emergency, and obtain ATC clearance.

11.7.2. Either pilot flies the aircraft with reference to terrain and the radar altimeter. Use of the autopilot is encouraged. INS/GPS should be selected for display on the PF's HSI.

11.7.3. The pilot not flying the aircraft maintains an outside scan, identifies turn points and checkpoints, and ensures clearance from terrain, obstructions and other aircraft. The crewmember occupying the jump seat will assist in these duties.

11.7.4. Use all available aids (i.e. INS/GPS, map reading, radio aids, and radar) to remain position oriented. Use known landmarks to crosscheck INS/GPS accuracy.

11.7.5. Prior to each turn point or altitude change point, brief the next altitude and heading as appropriate.

11.7.6. When the next leg altitude is higher than the leg being flown, cross the checkpoint at the higher altitude. If the next leg altitude is lower than the leg being flown, descent past the checkpoint.

11.7.7. A climb to emergency safe altitude should be initiated when any of the following conditions occur.

11.7.7.1. Position is uncertain (not known within 10 NMs of centerline).

11.7.7.2. Inadvertent weather penetration.

11.7.7.3. Crew becomes disoriented.

11.7.7.4. Either pilot must leave the seat during low altitude flight.

11.7.7.5. Aircraft or equipment malfunctions will distract the crew from primary duties.

Chapter 12

FLIGHT ENGINEER / AIRCREW MAINTENANCE SUPPORT PROCEDURES

12.1. General: This chapter contains flight engineer procedures not contained in the flight manual, other portions of this AFI, or other publications.

12.2. Responsibilities. The flight engineer is responsible to the pilot in command for all inspections and procedures required by the applicable technical orders and regulations.

12.2.1. Second Engineer. A qualified second engineer can perform scanner duties without direct supervision and is responsible to the primary engineer for the completion of all duties for which they are qualified. When performing primary FE duties, the second engineer must be under the supervision of an instructor or flight examiner.

12.2.1.1. DELETED

12.2.1.1.1. DELETED

12.2.1.1.2. DELETED

12.2.1.1.3. DELETED

12.2.1.1.4. DELETED

12.3. Authority to Clear a Red X. Flight engineers are not normally authorized to clear a Red X. If a situation is encountered where the aircraft is on a Red X and qualified maintenance personnel are not available to clear it, the highest qualified flight engineer on scene may obtain authorization to clear the Red X from the home station MXG/CC or designated representative, in accordance with T.O. 00-20-1. Other crew members are not authorized to clear a Red X. **EXCEPTION:** The flight engineer may clear Red Xs for fan stops, pitot covers, gear pins, engine cowls, access panels, throttle lock plate, NLG steering manifold input arm, and SPR drains when qualified maintenance personnel are not available, unless prohibited by the home station MXG/CC or designated representative.

12.4. Aircraft Servicing and Ground Operations. Flight engineers are normally not required to refuel or de-fuel aircraft; however, the flight engineer is qualified and authorized to accomplish these duties when maintenance personnel are not available. This policy is designed for support of the aircraft and its mission while away from home station. The applicable refueling and de-fueling checklists will be used during all refueling and de-fueling operations. If ground support personnel are not available, the aircraft commander will designate other crewmembers to assist the flight engineer. A flight engineer may assist the normal maintenance function, provided this action does not impact crew duty and crew rest limits specified in [Chapter 3](#) of this AFI.

12.4.1. Aircraft Refueling. Aircrew members qualified in ground refueling may perform refueling duties. Aircrews will only refuel in cases when maintenance support is not readily available and the mission would be delayed.

12.4.1.1. Avoid refueling with JP-8+100 while transiting airfields with JP-8+100 capabilities. AMC aircraft are not allowed to operate on JP-8+100, except in emergency conditions. All JP-8+100 locations are required to maintain a clean JP-8 capability to support transient aircraft. If inadvertent refueling with JP-8+100 occurs comply with the following:

12.4.1.1.1. De-fuel the aircraft prior to flight.

12.4.1.1.2. Make an AFTO Form 781 entry stating Caution: Aircraft refueled using JP-8+100, preventative measures must be taken when de-fueling.

12.4.1.2. When crewmembers are required to refuel, the flight engineer will act as the refueling team supervisor. Flight engineers acting as refueling supervisors and panel operators will comply with T.O. 00-25-172 and applicable T.O. 1C-5A-2 series T.O.s. When crewmembers are required to refuel due to lack of maintenance support, two refueling qualified personnel and an additional individual for scanner or safety duties are required. The additional individuals will be briefed on duties by the refueling team supervisor.

EXCEPTION: If left and right SPRs are used, two qualified personnel and two additional individuals are required.

12.4.2. Concurrent Ground Operations. The PIC and chief servicing supervisor (CSS) shall ensure aircrew members and servicing personnel accomplish concurrent servicing (CS) in accordance with T.O. 00-25-172 and servicing technical orders. Aircrews performing Dash-1 preflight inspections or cargo loading concurrent with servicing must have cooperation and close coordination with the CSS. The CSS will remain in continuous intercom contact with fuel servicing team members during the entire servicing operation. Team members include CSS, Single Point Refueling (SPR) monitor for each SPR in use, refueling panel monitor, and fuel specialists. When the aircrew is at the aircraft, the PIC is responsible for all aspects of aircraft operations and shall inform the CSS how aircrew members will participate in passenger evacuation/safety. In keeping with the guidelines in T.O. 00-25-172, CSS has authority over all phases of CS operations to include personnel participating in the refuel.

12.4.2.1. Use the following guidelines when CS operations are conducted with passengers on board:

12.4.2.1.1. A current and qualified crew member will be designated the passenger compartment monitor (PCM) and shall continuously monitor passengers during CS. PCMs will not perform other duties during servicing.

12.4.2.1.2. Designate a current and qualified crew member to remain on the flight deck to monitor interphone and be prepared to broadcast a request for emergency assistance on a radio tuned to the appropriate agency with ready access to an emergency response team. The PA may be used to direct passenger evacuation in an emergency.

12.4.2.1.3. The PCM shall brief passengers on emergency egress, exits, prohibitions, and hazards. Passengers will remain seated but will not wear seat belts during CS. When possible, conduct this briefing prior to servicing. If servicing is in progress, the briefing will be given immediately after boarding.

12.4.2.1.4. When authorized, passengers may board or exit the aircraft for the express purpose of loading for departure or off-loading upon arrival. Boarding or exiting must be opposite of servicing operations. Once onboard, except for emergencies, passengers shall not deplane once servicing commences.

12.4.2.1.5. Passengers are not required to ground themselves.

12.4.2.1.6. Passenger representatives will assist the PCM when passengers board and exit. Passengers must remain outside the vapor hazard area, the fuel servicing safety zone, oxygen servicing area, and 25 feet from fuel vents during servicing.

12.4.2.1.7. The PIC, or designated aircrew representative, or CSS will advise PCMs when to evacuate passengers.

12.4.2.1.8. Unless environmental conditions dictate, the primary emergency exit will remain open and stairs in place. Fuel servicing is limited to the right side. Close doors except the open entry door. Stairs shall remain in place.

12.4.2.1.9. The PCM shall set the interior lighting as bright as possible to suit the combat environment.

12.4.2.1.10. The loadmaster shall ensure cargo loading or unloading does not jeopardize passenger safety. Do not load/unload cargo containing explosives, oxygen, flammable gases or liquids during CS.

12.4.2.2. Simultaneous fuel and oxygen servicing is not authorized.

12.4.2.3. Winching of rolling stock and non-spark producing pallets is authorized. Driving vehicles equipped with spark arrests is authorized. When loading vehicles without spark arresters, the vehicles must be completely inside the cargo compartment or outside of the established fuel servicing safety zone before fuel servicing lines can be pressurized.

EXCEPTION: Diesel and turbo-charged (without waste gates) gasoline-powered vehicles can be on-loaded or off-loaded without having to stop fuel flow.

12.4.3. The following guidance will be used for fuel servicing (refuel) operations only:

12.4.3.1. Electric and electronic equipment may be on and operated to include operations performed by flight engineer during required inspections with the following exceptions:

12.4.3.2. TACANs and radar altimeter must be turned off.

12.4.3.3. Radar will be in standby, test, or off.

12.4.3.4. IFF will be in standby or off.

12.4.3.5. Radio operations are authorized.

EXCEPTION: Use of HF radio is prohibited.

12.4.3.6. Passengers are prohibited in the cargo compartment during winching.

12.4.3.7. APUs and ATMs may be used. Judgment must be used; see requirements in T.O. 00-25-172 and 1C-5A-2-1CL-6.

12.5. Aircraft Structural Integrity Program. The purpose of this program is to provide a reliable system for predicting potential or impending failures based on historical records of the aircraft's exposure to those actions contributing to fatigue failures.

12.5.1. The program is monitored through the use of AF IMT 4097, **Aircraft Identification**.

12.5.2. Flight engineer will:

12.5.2.1. Ensure all applicable sections of AF IMT 4097 are completed according to procedures in paragraph 12.5.3.

12.5.2.2. Always leave a newly initiated form on the aircraft. Initiate a new form by completing section I.

12.5.2.3. Place all completed AF IMT 4097s in aircraft stowage pouch along with newly initiated form.

12.5.2.4. At home station, remove all completed AF IMT 4097s from pouch and turn into maintenance debrief.

NOTE: If the crew and maintenance do not conduct a formal debrief (e.g. first period local, mission thru-flights, debrief not available), AF IMT 4097s will be left in pouch. (Units may establish local procedures if deemed necessary to minimize lost forms.)

12.5.2.5. When interflying with another wing's aircraft, the engineer returning the aircraft to its home station will turn in all completed AF IMT 4097s to maintenance debrief. (note above applies.)

12.5.2.6. When delivering an aircraft to depot or another wing, the engineer will return all completed AF IMT 4097s for routing to home-station maintenance documentation section.

12.5.3. AF IMT 4097 instructions.

12.5.3.1. The AF IMT 4097 will be closed out after each sortie, runway abort, or landing on a substandard runway. The criteria in AFI 11-401, and MAJCOM supplement, pertaining to sorties, landing, and flying time entries made in the AFTO 781 by the pilot in command apply, with the following exceptions:

12.5.3.1.1. Do not start a new log for in-flight mission symbol changes.

12.5.3.1.2. Do not start a new log for practice full stop landings at a point other than the point of takeoff.

12.5.3.1.3. Start a new log when the aircraft remains on the ground more than 20 minutes after touchdown, regardless of circumstances.

12.5.3.2. Weights. Except for section VI, enter weights to the nearest thousand pounds. Always right adjust the three columns. For example, enter a weight of 94,500 pounds as 095. For section VI, enter values in thousands and tenths of thousands, such as 94.5 for the above example.

12.5.3.3. Altitudes. Enter altitude to the nearest thousands of feet in section III. Enter altitude as thousands and tenths of thousands of feet in section V. The decimal point is on the form.

(EXAMPLE: Enter 24,600-feet as 24.6 in section V.)

12.5.3.4. Accuracy and neatness are essential. All numbers and letters must be legible. Do not use diagonal marks (/) on zeroes.

12.5.3.4.1. **Section I**, Aircraft Identification. Complete an AF IMT 4097 for each sortie or condition as defined in paragraph A1.1.1. Do not complete a log for any ground operation or sortie that does not involve an attempted takeoff. This includes ground aborts for maintenance, operations, weather, and onload or offload exercises. When a sortie is terminated before an

attempted takeoff, transcribe the section I information contained on the log to a new AF IMT 4097. Use the same log number.

12.5.3.4.1.1. Effective Date. The Zulu date the form is started. For each mission departure from home station, the AFTO 781J, **Aerospace Vehicle-Engine Flight Document**, will contain the correct information for the effective date and columns 1-20 in a special block. This information will be used for confirmation. All discrepancies on the AF IMT 4097 will be corrected to agree with the AFTO 781J.

12.5.3.4.1.2. Columns 1-3. Aircraft tail number: Enter the last 3 numbers of the aircraft's serial number.

12.5.3.4.1.3. Columns 4-8. Log number: Only one log number will be used for each sortie flown. Place the year in columns 4-5. Right adjust the remaining three digits, ending in column 8. Unused columns should contain zeroes. No dashes are permitted. **EXAMPLE:** The ninth log of the calendar year 2005 would be entered as 05009.

12.5.3.4.1.4. Column 9. Normally, the letter "A" will be entered in this column. (**EXCEPTION:** Enter C when ALDCS is off; enter D when air refueling with a KC-10 tanker and ALDCS is off; enter E when air refueling with KC-10 tanker and ALDCS is on.) In instances when additional AF IMT 4097s are needed (i.e. aborted takeoff, aircraft remaining on the ground more than 20 minutes after an intermediate landing, landings on substandard runways), add a suffix letter beginning with B through Z with the exception of C, D, and E explained above. (**EXAMPLE:** Initial log number 05011A, aircraft aborts takeoff for a door warning light on--initiate new log with number 05011B. Aircraft makes a full stop landing with taxi back for another takeoff, but is delayed on the ground over 20 minutes--initiate a new log with number 05011F. The mission is then completed after further flight. The aircraft has flown one sortie and has used one log number although three AF IMT 4097s are completed.)

NOTE: When an AF IMT 4097 is initiated for a flight that is aborted on the runway during an attempted takeoff resulting in mission termination, the form will be completed as much as possible. Include the reason for the abort in the remarks section.

12.5.3.4.1.5. Columns 10-12. No entries will be made in these columns.

12.5.3.4.1.6. Columns 13-17. Airframe hours: To nearest hour. Decimal and tenth of hour omitted.

12.5.3.4.1.7. Columns 18-20. AGS: Aircraft Generation Squadron. (**EXAMPLE:** 60 AGS would be entered as 060.)

12.5.3.4.2. **Section II**, Initial Takeoff and Final Landing Data. Complete section II as follows: FE-- enter rank, last name, and flying organization of FE at panel for takeoff.

12.5.3.4.2.1. Initial Takeoff Data:

12.5.3.4.2.1.1. Columns 21-24. Date: Enter the takeoff Zulu date as day and month.

12.5.3.4.2.1.2. Columns 25-27. Gross weight: Aircraft gross weight at brake release. (Zero fuel weight plus columns 30-32, fuel weight at takeoff) Entry will be to the nearest thousand pounds. (See paragraph [12.5.3.4.6.2.](#))

12.5.3.4.2.1.3. Columns 28-29. CG: Takeoff center of gravity to the nearest whole percent.

12.5.3.4.2.1.4. Columns 30-32. Fuel weight: Fuel weight at brake release to the nearest thousand pounds. (See paragraph [12.5.3.4.6.2.](#))

12.5.3.4.2.1.5. Columns 33-36. Time Z: Sortie takeoff time to agree with the takeoff time as recorded on the AFTO 781. (See EXCEPTIONS at paragraph [12.5.3.1.](#))

12.5.3.4.2.1.6. Columns 37-40. Airfield ICAO code: ICAO designation (4 letters) for the airfield at which the takeoff occurred. If no ICAO code is listed for an airfield, leave blank and annotate the name of the airfield of takeoff in the remarks section.

12.5.3.4.2.1.7. Column 41. Substandard runway: Enter an "X" if the runway is not asphalt or concrete.

12.5.3.4.2.2. Final Landing Data:

12.5.3.4.2.2.1. Columns 42-44. Fuel weight: Fuel weight at engine shutdown or 5 minutes after final touchdown, whichever comes first, to the nearest thousand pounds.

NOTE: This entry and the fuel entry (columns 30-32) are extremely important and must be accurate. The chronological event (cruise periods, touch-and-go (T&G), intermediate full stops and takeoffs) fuel weight is computed using the initial takeoff and final landing fuel weight.

12.5.3.4.2.2.2. Columns 45-48. Time Z: Sortie landing time as recorded on the AFTO 781. (See EXCEPTIONS at paragraph [12.5.3.1.](#))

12.5.3.4.2.2.3. Columns 49-52. Airfield ICAO code: ICAO designation (4 letters) for the airfield at which the final landing occurred. If no ICAO code is listed for an airfield, leave blank and annotate the name of the airfield of landing in the remarks section.

12.5.3.4.2.2.4. Column 53. Substandard runway: Enter an "X" if the runway is not asphalt or concrete.

12.5.3.4.2.2.5. Column 54. Fuel sequencing: Enter "S" for standard fuel sequence; enter "N" for nonstandard fuel sequence. When "N" is entered, make an entry in the remarks block to indicate fuel quantity in each tank containing fuel, and the total flight time spent in nonstandard configuration.

12.5.3.4.3. **Section III**, Flight Profile Data:

12.5.3.4.3.1. This section allows for four separate cruise periods. Do not enter temporary cruise periods of less than 15 minutes (due to clearance changes, weather, etc.). Entries are required for low-level clean configuration events where a cruise period time and altitude is held longer than 5 minutes at 6,000-foot mean sea level (MSL) or lower. Neither traffic nor the climb or descent portions of the sortie are to be entered. These entries are to be made left-to-right in chronological time sequence as they occur. The first cruise period start time should begin after the initial climb and cruise is stabilized. Cruise period stop times should be entered when one of the following events occur:

12.5.3.4.3.1.1. Climb or descent in excess of 4,000-feet from recorded altitude is initiated.

12.5.3.4.3.1.2. Altitude increases by more than 4,000 from the last recorded value. This may occur when multiple step-climbs (less than 4,000-feet each) are performed.

12.5.3.4.3.1.3. Cruise Mach number is stabilized at 0.10 from the last recorded value.

NOTE: Climb and descent criteria will normally govern when to close out a cruise period. The Mach number change criteria is possible during aerial refueling operations and turbulence encounters.

12.5.3.4.3.2. Subsequent cruise periods should begin when Mach/altitude conditions are stabilized. The stop time for the last chronological cruise entry indicates scheduled cruise has ended and descent for landing follows.

NOTE: Cruise entries are not required if the entire flight remains in the initial takeoff airfield's traffic pattern. (See section II, columns 37-40.) However, a cruise entry will be required when:

12.5.3.4.3.2.1. The traffic pattern altitude (6,000-feet MSL) is exceeded, regardless of time duration.

12.5.3.4.3.2.2. Each time an aircraft departs from one base traffic pattern and flies to another base regardless of altitude or time duration.

12.5.3.4.4. **Section IV**, Transition Training—Touch-and-go Landings, Additional Full Stops, and Takeoffs.

12.5.3.4.4.1. Columns 10-11. Sequence number: Key punch instructions, no entry required.

12.5.3.4.4.2. Columns 12-55. T&G: There is space to record 22 touch-and-go landings. Enter additional T&Gs in remarks column, if required. Enter the Zulu time at touchdown for each T&G. Enter T&Gs left to right on the first line as they occur. After the 11th T&G entry, begin second line and enter 12th and subsequent T&Gs left to right as they occur. Leave unused portion blank. Do not skip any entries. Time entries should always be ascending in chronological order (allowance is made for passing through 2400Z).

12.5.3.4.4.3. Columns 56-59. Full stop: There is space to record two practice full stop landings. Enter additional full stop landings in the *remarks* section. Enter the Zulu time at touchdown for the first practice full stop on the first line. Leave unused portion of section IV blank.

NOTE: Do not enter practice landings on substandard runways. A new log must be accomplished for each substandard runway practice landing.

12.5.3.4.4.4. Columns 60-63. Takeoff: There is space to record two additional takeoffs. Enter additional takeoffs in remarks section. Enter the Zulu time at takeoff for the additional takeoffs as they occur. Leave unused portion blank.

12.5.3.4.5. **Section V**, In-flight Operations:

12.5.3.4.5.1. Columns 10-11. Sequence numbers: Key punch instructions, no entry required.

12.5.3.4.5.2. Columns 12-16. Event: Place an "X" in the appropriate column.

12.5.3.4.5.3. Column 12. Terrain Following (TF)/Low Level (LL).**

12.5.3.4.5.4. Column 13. Aerial Refueling (R).*

12.5.3.4.5.5. Column 14. Airdrop (A).*

12.5.3.4.5.6. Column 15. Cargo Jettison (CJ).*

12.5.3.4.5.7. Column 16. Fuel Jettison (FJ).

*Simulated events will be recorded.

**Usually applies during tactical VFR training (TVT) sorties. Use LL when flying a clean configuration event at or below 2,000-feet AGL for longer than 5 minutes.

12.5.3.4.5.8. Columns 17-20. Event start time (Zulu time): For airdrop or cargo jettison, the start time is when the aerial delivery system (ADS) doors start to open. For AR, start time is when the aircraft enters tanker wake turbulence or the aircraft is within approximately 500-feet of the tanker.

12.5.3.4.5.9. Columns 21-24. Event stop time (Zulu time): For airdrop or cargo jettison, stop time is when the ADS doors are closed. For AR, time ends when the aircraft leaves the tanker wake turbulence or the aircraft is approximately 500-feet from the tanker.

12.5.3.4.5.10. Columns 25-27. Incremental weight: Enter the weight unloaded or off-loaded for the event "X-ed" in columns 12-16. Enter "000" for simulated events.

12.5.3.4.5.11. Columns 28-31. Altitude or clearance plane setting: Enter the altitude in thousands and tenths of thousands of feet. A decimal point has been provided on the form. For terrain following and low-level, enter the altitude in feet AGL.

12.5.3.4.5.12. Columns 32-39. Terrain following and low-level: If an "X" was placed in column 12, make the following entries:

12.5.3.4.5.12.1. Columns 32-33. Route code: Enter the code number of low-level route flown.

12.5.3.4.5.12.2. Columns 34-35. Mode: Place an "X" in the appropriate column, "A" for automatic, "M" for manual.

12.5.3.4.5.12.3. Column 36. Ride setting: Enter a "0".

12.5.3.4.5.12.4. Columns 37-39. Mach: Enter the 3-digit Mach number being flown for terrain following. (Decimal is assumed.)

NOTE: An altitude entry is required for all events. Columns 17-31 must be completed for each event. Columns 32-39 must be completed for terrain following and low level only. Do not place decimal points in any columns. All allowed decimal points are preprinted on the form.

12.5.3.4.6. **Section VI**, Sortie Time and Takeoff Weight Computation:

12.5.3.4.6.1. Flight Duration:

12.5.3.4.6.1.1. Landing time: Enter the ending Zulu landing time.

12.5.3.4.6.1.2. Takeoff time: Enter the initial Zulu takeoff time.

12.5.3.4.6.1.3. Total time: Enter the total flight time in hours and minutes.

12.5.3.4.6.1.4. Total time: Enter the total flight time in hours and tenths.

NOTE: The takeoff and landing time entries in sections II and VI should be identical and should be the same as recorded in the AFTO 781 for the sortie being reported. (See paragraph 12.5.3.1. for exceptions.)

12.5.3.4.6.2. Takeoff Weight Computation. Complete the takeoff weight computation portion when computing takeoff requirements. The operating weight and cargo, passenger, and miscellaneous weight entries should not change. The fuel weight at brake release is subject to change due to unforeseen delays. The FE need not readjust section VI entries in case of delays. The FE should always enter the corrected fuel weight and gross weight at takeoff in section II.

NOTE: LN2 weight will be included in the aircraft operating weight.

12.5.3.4.6.3. Remarks: Enter any appropriate comments that could influence aircraft fatigue factors. Examples are: severe turbulence encountered, hard landing, nonstandard fuel sequence, high load maneuvers, unpressurized flight, and in-flight thrust reverser operation. If active lift distribution control system (ALDCS) is off or inoperative in flight, record the conditions and flight duration. Record the appropriate sequence number from section V, In-flight Operations Data, of any AR event occurring behind the KC-10.

EXAMPLE: "KC-10 A/R, seq XX" where "XX" is the sequence number. Other required remarks are mentioned in the various section instructions.

NOTE: If all blocks for a specific maneuver are completed and additional blocks are needed, use another AF IMT 4097 for continuation. Use same log number and annotate in the remarks section of the continuation form, "Continuation of log number XXXXX."

12.6. Not Used.

12.7. Performance Data, including TOLD Card. T.O. 1C-5A-1-1 or MAJCOM approved computer based TOLD program will be used for all aircraft performance calculations. All performance data will be computed by a first flight engineer or higher. A second engineer may compute performance data if supervised by an instructor. TOLD computations will be placed on the AF Form 4098, *TOLD Card Worksheet*. When completing AF Form 4099, *TOLD CARD (C-5)*, engineer will annotate the takeoff and landing gross weight, as appropriate, in the upper left hand corner.

EXCEPTION: The TOLD Card Worksheet printed from computer based TOLD program version 3.4.3 or higher may be used in lieu of AF Form 4098.

12.7.1. All TOLD calculations will be verified by another qualified flight engineer (preferred) or a pilot. Aircraft takeoff and landing gross weights will be verified by comparing to 365-4 or another independent means. One of the following methods will be used for TOLD verification:

12.7.1.1. FSAS, except when GW is limited by 3 engine climb.

12.7.1.2. TAB data contained in pilot's checklist (1C-5A-1CL-1) for conditions listed in 1C-5A-1CL-1.

12.7.1.3. T.O. 1C-5A-1-1.

12.7.2. Runway slope calculations. When using non-DoD/NOAA airfield diagrams and approach plates to determine runway information for takeoff and landing data calculations, the aircrew must calculate runway slope since non-DoD/NOAA publications do not do this for you. To calculate run-

way slope you must extract the departure end elevation and approach end elevation from the airfield diagram and use the following formula:

$$\text{Slope in Percent} = \frac{(\text{Departure End Elevation} - \text{Approach End Elevation})}{\text{Runway Length}} \times 100$$

12.7.3. Field elevation calculations. For all TOLD calculations other than obstacle clearance use the airfield field elevation. Use one of the following elevations for obstacle clearance calculations:

12.7.3.1. No depicted slope. Use the *lowest* elevation on departure runway.

12.7.3.2. Depicted slope. Use the *highest* elevation on departure runway.

12.7.4. During performance calculations, the engineer will ensure the following:

12.7.4.1. Gross Weight (GW). Aircraft does not exceed maximum GW, zero fuel weight (ZFW), or center of gravity (CG) specified in aircraft flight manual. GW may be further restricted by operating conditions such as icing, temperature, pressure altitude, runway length and slope, aerodrome weight bearing capacity, departure maneuvering, and known limiting obstacles.

12.7.4.1.1. DELETED

12.7.4.2. DELETED

12.7.4.3. DELETED

12.7.4.4. DELETED

12.7.5. Obstacle clearance and climb gradient calculations. All inputs required for obstacle clearance and climb gradient calculations will be provided by the PIC on a MAJCOM approved Departure Planning Worksheet as specified in paragraph 6.16. The FE will calculate TOLD using SDP or Non-SDP procedures as applicable to the specific departure, in accordance with the Departure Worksheet Instructions and the T.O. 1C-5A-1-1.

12.7.5.1. Average (10 nm) AEO climb gradient. Compute using computer based program or enter sheet 1 of fig A3-17 at 10 NM and intersect aircraft COF. Read height at obstacle and divide by 10 to obtain average AEO climb gradient.

12.7.5.1.1. Ensure this climb gradient is no lower than required AEO climb gradient listed on departure worksheet. If required climb gradient cannot be achieved perform paragraph 12.7.5.1. calculation using sheet 2 of Fig A3-17. If this climb gradient is equal to or greater than required climb gradient the flaps must be left at 40% with power set at Takeoff-inflight until climb gradient restriction is met.

12.7.5.2. DELETED

12.7.5.3. DELETED

12.7.5.3.1. DELETED

12.7.5.3.2. DELETED

12.7.5.3.3. DELETED

12.7.5.3.4. DELETED

12.7.5.3.5. DELETED

12.7.5.4. DELETED

12.7.5.4.1. DELETED

12.7.5.4.2. DELETED

12.7.5.4.2.1. DELETED

12.7.5.4.2.2. DELETED

12.7.5.4.2.3. DELETED

12.7.5.4.2.4. DELETED

12.7.5.4.2.5. DELETED

12.8. Fuel Planning/Management. AF Form 4054, *Performance and Fuel Management Log*. The purpose of this form is to provide the PIC a snap shot view of aircraft performance and fuel consumption. If an AF Form 4054 is completed on a mission leg which required a fuel divert FEs will ensure completed AF Form 4054 is turned into squadron standardization/evaluation section along with fuel card and computer flight plan.

12.8.1. Use T.O. 1C-5A-1-1 and appropriate information from AF IMT 4052, **C-141/C-130/C-5/Refueling Computation** (AR fuel card) or AF IMT 4053, **INS Flight Plan and Log** (normal fuel card) to complete AF IMT 4054:

12.8.1.1. On all category I routes and overwater missions.

12.8.1.2. For any flight that is not flown within the parameters used for flight and fuel planning or when the time behind flight plan exceeds 15 minutes. (**EXAMPLE:** Flight and fuel planned for FL 330 step climb profile, but cleared for cruise at FL 290 constant.)

12.8.1.3. On missions that overfly island bases, maintain a fuel management log until final destination is assured. (**EXAMPLE:** Hickam - Wake - Guam.)

12.8.1.4. To compute the "Fuel Onload Confirmation" section on all operational air refueling missions regardless of the routing.

12.8.1.5. When directed by the aircraft commander.

12.8.2. Section I :

12.8.2.1. Zero Fuel Weight (ZFW). Obtain zero fuel weight from the DD 365-4, **Weight and Balance Clearance Form F—Transport/Tactical**.

12.8.2.2. Takeoff (TO) FUEL. Obtain takeoff fuel by adding fuel tank quantities.

12.8.2.3. TO GW. Calculate takeoff gross weight by adding ZFW to T/O FUEL.

12.8.2.4. TEMPERATURE DEVIATION. Use en route temperature deviation (CFP, forecast, or actual), whichever is considered the most accurate.

12.8.2.5. INITIAL ALTITUDE. Confirm initial four-engine cruise ceiling using level-off gross weight and temperature deviation.

12.8.2.6. ENGINE OIL READINGS. Record oil pressure and temperature during first stabilized cruise segment.

12.8.2.7. AIR REFUELING. Before takeoff obtain: BURNOFF BEHIND TANKER from AF IMT 4052, block 15 or 36, FUEL REQUIRED AT EXIT from block 31 or 52, and PLANNED TRANSFER from block 19 or 40. Calculate SUBTOTAL by adding FUEL REQUIRED AT EXIT to BURNOFF BEHIND TANKER. Subtract the PLANNED TRANSFER from the subtotal to obtain FUEL REQUIRED AT ARCP. 45 minutes before the ARCP compute ESTIMATED FUEL AT ARCP based on your ETA to the ARCP. Subtract from the SUBTOTAL to obtain REQUIRED TRANSFER. Advise the aircraft commander of the required fuel transfer. AIR REFUELING periods 2 and 3 are completed in the same method if required.

12.8.3. Section II :

- 12.8.3.1. "A. BEGIN DESCENT TIME." Obtain begin descent time from the pilot.
- 12.8.3.2. "B. TIME." Record Zulu time of observation.
- 12.8.3.3. "C. ZFW." Obtain zero fuel weight from DD 365-4 or ZFW block above.
- 12.8.3.4. "D. FUEL REMAINING." Obtain fuel remaining from fuel gauge readings.
- 12.8.3.5. "E. GW." Calculate actual gross weight by adding FUEL REMAINING to ZFW.
- 12.8.3.6. "F. ALT/MACH." Record current flight level and mach number. **EXAMPLE:** 350/77.
- 12.8.3.7. "G. TEMP DEV." Use en route temp dev (CFP, forecast, or actual), whichever is considered the most accurate for the remainder of the flight.
- 12.8.3.8. "H. PAGE #." Page number in TO 1C-5A-1-1, used to compute time in block I.. Enter Comp if electronic program is used.
- 12.8.3.9. "I. FUEL ETE." Compute fuel ETE using computation blocks at bottom of form (section III), and record in hours and minutes.
- 12.8.3.10. "J. ETE BDP/OH or ARCP." Subtract Zulu time from BDT to obtain ETE BDP/OH or ARCP.
- 12.8.3.11. "K. EXTRA TIME." Subtract ETE BDP/OH or ARCP from FUEL ETE to obtain EXTRA TIME.
- 12.8.3.12. "L. 4 ENG CEIL." Compute 4-engine cruise ceiling using current gross weight and actual temperature deviation.
- 12.8.3.13. "M. 3 ENG CEIL." Compute 3-engine cruise ceiling using current gross weight and actual temperature deviation.
- 12.8.3.14. "N. PILOT'S INITIALS." Pilot will review and initial at least every hour and 20 minutes and may discontinue the form at his or her discretion.

12.8.4. Section III :

- 12.8.4.1. FUEL REQUIRED OH or ARCP. Enter FUEL REQUIRED OH from AF IMT 4053 (block 13) or AF IMT 4052 (block 56) for airland/final destination or FUEL REQUIRED ARCP from AF IMT 4054 section 1 for air refueling missions.
- 12.8.4.2. ZFW. Enter zero fuel weight.
- 12.8.4.3. OH GW/TIME. Obtain OH GW by adding FUEL REQ OH or ARCP and ZFW. Obtain TIME using the applicable TEMP DEV and 1C-5A-1-1 performance charts or electronic program.

12.8.4.4. AGW/TIME. Record actual gross weight. Compute TIME using the applicable TEMP DEV and 1C-5A-1-1 performance charts or electronic program.

12.8.4.5. FUEL ETE. Subtract AGW/TIME from OH GW/TIME to compute FUEL ETE. Fuel ETE will be recorded in hours and minutes.

12.9. Not Used.

12.10. Fault Code Reporting Procedures.

12.10.1. The fault reporting method (FRM) is used to isolate system malfunctions with a minimum amount of troubleshooting and provide a description of the malfunction for maintenance.

12.10.2. System malfunctions, whether monitored by MADAR (auto or manual) or observed by a crewmember, will be troubleshot using the Fault Reporting Method (FRM) or Fault Isolation Manual (FIM) procedures contained in MADAR to maximum extent possible.

12.10.3. The manual fault code (FC) derived from the troubleshooting routine and the auto fault code reported by MADAR will be recorded in AFTO 781A along with the description of the malfunction. Include any additional information required for clarification of the discrepancy.

12.11. Weight and Balance. The flight engineer is responsible for completion of DD 365-4 (Form F), in the absence of a qualified Loadmaster when no cargo or passengers are on board.

12.12. Power-On-Preflight (POP) Program. If accomplished, the maintenance POP inspection should be completed NLT enlisted crew show at the airplane and documented in aircraft forms. Normally, one of the maintenance inspectors will conduct a face-to-face briefing with the FEs. Maintenance supervision officer/superintendent approval is required if a face-to-face cannot be accomplished. If the aircraft has been POP inspected FEs will accomplish the following:

12.12.1. FEs will accept the maintenance POP inspection and not accomplish a full -1 preflight.

EXCEPTION: With PIC approval, a full preflight may be accomplished if absolutely necessary for training or evaluation. Alert times will not be adjusted on 618 TACC directed missions to accommodate this option.

12.12.2. Accomplish FE & Scanner's POP inspection using AMC approved checklists. Current checklist can be found on AMC/A3V website.

12.12.2.1. FEs will also accomplish any steps from maintenance POP checklist not accomplished or items worked on after maintenance POP completed.

12.13. Monitoring Primary Radios. The FE will monitor the primary radio for flight clearances, altitudes, heading changes, and radio frequencies. The FE is not required to copy departure clearances.

12.14. Scanner Duties. After takeoff, the scanner will normally make a walk-around when flaps are retracted, the after-takeoff climb checklist has been initiated, and the airplane is clear of turbulence. The walk-around should be completed by 10,000-foot altitude.

12.15. Ground Refueling Procedures with Inoperative Fuel Quantity Indicators:

12.15.1. The tank with the inoperative indicator and the corresponding tank on the opposite wing will be emptied and will not be serviced by maintenance.

12.15.2. When a single refueling unit is used, the tank with the inoperative fuel quantity indicator will be filled individually and prior to remaining tanks, when possible, within wing loading limitations.

12.15.3. When a dual refueling unit is used, the tank with the inoperative fuel quantity indicator and the corresponding tank on the opposite wing may be filled simultaneously.

12.15.4. The refueling unit shall be used to determine the amount of fuel in the tank with inoperative indicator.

12.15.5. As an alternative, a known quantity of fuel may be transferred from an adjacent tank to a tank with inoperative quantity indicator. The crew will transfer fuel internally to the configuration or sequence required prior to flight when servicing is completed according to paragraph 12.15.6.

12.15.6. Maintenance may service aircraft to the following fuel values without the aircrew monitoring:

12.15.6.1. Outboard main tank inoperative—284,000 pounds.

12.15.6.2. Inboard main tank inoperative—281,000 pounds.

12.15.6.3. Outboard or inboard auxiliary tank inoperative—269,000 pounds.

12.15.6.4. Outboard or inboard extended range tank inoperative—278,000 pounds.

CAUTION: Observe wing differential loading limits.

12.16. Wheel and Brake Procedures. If dragging wheels or brakes are suspected during taxi, deplane the scanner and comply with Paragraphs 12.16.1.1. through 12.16.1.5. Comply with paragraphs 12.16.1. and 12.16.2. if any portion of the fire suppression system (FSS) wheel well fire detecting system is inoperative.

12.16.1. Predeparture End-of-Runway Inspection for Overheated Brakes. This is applicable to all departures unless the aircraft is parked on or immediately adjacent to the takeoff portion of the active runway. The aircrew will complete the predeparture end-of-runway inspection as follows:

12.16.1.1. Use the scanner and another crewmember other than pilot, copilot, or FE. The additional crewmember deplanes with scanner and performs scanner duties while scanner accomplishes brake check.

12.16.1.2. Maintain interphone contact throughout the inspection.

12.16.1.3. To inspect, approach directly from the front or rear of the tire, touch main landing gear tire and cautiously move the hand toward the wheel. Then place the hand near the brake to determine excessive heat without touching the brake surface. Repeat for each main landing gear (MLG) wheel and brake assembly.

12.16.1.4. If any brake is significantly hotter than the majority advise maintenance corrective action is required. If an obviously dangerous overheated condition is observed do not taxi the airplane.

12.16.1.5. If no brake is found significantly hotter than the majority of brakes, the brake check is satisfactory.

12.16.2. In-flight Procedures:

12.16.2.1. Inspect the MLG wheel wells after takeoff for evidence of heat, smoke, or fire. If abnormalities are detected, extend the landing gear immediately at or below 250 KCAS/.60 Mach.

12.16.2.2. Inspect the cargo compartment sidewall and floor areas adjacent to the MLG wheel wells for evidence of heat (discoloration or variation in surface temperature) at 15-minute intervals for the first hour of flight. Inspect hourly for the remainder of flight.

Chapter 13

CARGO AND PASSENGER HANDLING PROCEDURES

13.1. General. Loadmasters coordinate loading or offloading with air terminal operations or shipping agencies; plan loads; and supervise loading or offloading operations. Loadmasters perform preflight and postflight of aircraft and systems and compute aircraft weight and balance. Loadmasters provide in-flight services to passengers and troops, and monitor security of cargo, mail, and baggage during flight.

13.2. Responsibilities for Aircraft Loading.

13.2.1. AMC Designated Stations.

13.2.1.1. Aerial Port personnel are responsible for selecting cargo and mail for airlift, completing documentation, palletizing cargo, load planning, computing load distribution, and moving cargo to and from the aircraft to meet scheduled departure. Before starting loading operations, they will advise the loadmaster of destination, size, weight, and type of cargo (classified, hazardous, etc.) to permit proper positioning. They will coordinate traffic activities affecting loading and offloading and assign sufficient load team personnel for cargo handling. Aerial Port personnel are responsible for safe positioning of material handling equipment and cargo to or from the aircraft cargo door, ramp, or auxiliary ground loading ramps. Under supervision of the loadmaster, the load team will prepare the aircraft for loading, load the aircraft and apply tiedown to cargo and equipment; release tiedown, offload cargo, and stow loading and tiedown equipment if the aircraft is not to be reloaded.

13.2.1.2. The loadmaster is responsible for aircraft preflight, certifying load plans; operating aircraft equipment; supervising and directing loading and offloading operations; cargo tiedown and preparation of the DD 365-4, **Weight and Balance Clearance Form F-Transport/Tactical**. They coordinate with the loading crew supervisor to verify cargo against manifests. The loadmaster supervises loading operations and is responsible for safe movement of cargo into and out of the aircraft. The loadmaster will brief the PIC on any hazardous cargo and jettison capability prior to engine start.

13.2.1.3. Loads planned by qualified load planners will be accepted by the loadmaster and loaded aboard the aircraft as planned, unless the load or any portion of it will compromise flight safety or does not comply with applicable aircraft technical orders or USAF and MAJCOM publications. If cargo is refused or rearranged for these reasons, forward all applicable information, including a copy of the load plan, to HQ AMC/A3V through standardization channels. AMC personnel attach an AMC Form 54, *Aircraft Commander's Report on Services/Facilities*.

EXCEPTION: The loadmaster may deviate from load plans to facilitate ease of onload or offload of cargo and to alleviate unnecessary aircraft reconfiguration without submitting documentation. The loadmaster must take into consideration the next station's cargo configuration requirements and will ensure the aircraft is in proper weight and balance limits. A new load plan is not required for this exception.

13.2.1.4. Loadmasters are the on-scene experts for load planning and accepting cargo for airlift. Some loads are not specifically detailed in applicable directives and require the loadmasters to use their best judgment, to determine the best and safest method of loading the cargo. When difficul-

ties arise, they should seek advice of other personnel (i.e., squadron, group, wing, or MAJCOM standardization/evaluation personnel).

13.2.2. At locations without AMC air terminal or traffic personnel, the shipper assumes responsibilities described in paragraph 13.2.1.1. and provides sufficient qualified personnel and handling equipment for loading or offloading. Loadmaster responsibilities and authority are the same as described in paragraphs 13.2.1.2. and 13.2.1.3.

13.2.3. During Joint Airborne Air Transportability Training (JA/ATT), Special Assignment Airlift Mission (SAAM), USAF mobility, and contingency missions, the loadmaster can accept DD 2133, **Joint Airlift Inspection Record**, as a valid pre-inspection of equipment being offered for air shipment. This form, validated by two joint inspection signatures (user and transporting force), may be used in lieu of the applicable portions of the T.O. 1C-5A-9CL-1. The DD 2133 will not be used to document preparation of hazardous materials. This will be accomplished using the Shipper's Declaration for Dangerous Goods.

13.3. Emergency Exits and Safety Aisles.

13.3.1. Cargo compartment troop doors and the crew entrance door will be unobstructed and operative when passengers and troops are transported in cargo compartment.

13.3.2. Ensure that at least one unobstructed safety aisle is available in the cargo compartment to allow movement between the flight deck and the troop compartment. Cargo and loose equipment shall not be stowed on the cargo compartment walkways.

13.3.3. Troop compartment occupancy is limited to 40 total personnel, including crewmembers, when either #3L or #3R escape hatches are not fully operational. Passengers will not be transported when either the #4 escape hatch or the #6 service door is not fully operational. The slide and associated exit shall meet the following requirements to be considered fully operational:

13.3.3.1. The slide must be capable of pneumatic inflation.

13.3.3.2. Exits must be capable of being opened with reasonable effort.

13.3.3.3. The #6 service door guides must remain in the tracks and the door must stay latched in the open position.

13.3.3.4. Emergency Exit Light installed and charging.

13.4. Pre-mission Duties.

13.4.1. Cargo Missions.

13.4.1.1. Aircraft loadmasters in coordination with aerial port personnel establish loading times. Loading times that differ from the normal pre-departure sequence will be established, with PIC coordination, before the loadmasters enter crew rest. Loading time is governed by the type and complexity of load, not by port saturation or management of aerial port workload levels. When reporting for duty, the cargo loadmaster checks in with the Air Terminal Operation Center (ATOC) or other designated location to obtain load breakdown and assist in load planning as required.

13.4.1.2. Phase II Loading Operations. Phase II is an aerial port loading program directly managed and supervised by air transportation personnel. It provides port units the flexibility to determine the best time to load or off-load aircraft when aircrew support is not available. The intent of

the program is to allow aerial port management the ability to evenly distribute port workloads. It will not serve as an aircrew enhancement or alleviate the loadmaster's responsibility to on/off load aircraft. Phase II on/off load operations are not authorized for:

13.4.1.2.1. In transit aircraft with ground times less than 4+15 minutes.

13.4.1.2.2. Loads requiring use of the aircraft winch.

13.4.1.2.3. Loads through the nose of the aircraft.

13.4.1.2.4. Loads requiring the aircraft to kneel.

13.4.1.2.5. Rolling stock that exceeds 25,000 pounds.

13.4.1.2.6. Specific loads contained in TO 1C-5A-9-2.

13.4.1.3. Proper cargo documentation must accompany each load. A consolidated manifest will be delivered to the aircraft prior to departure unless one is not available due to a lack or failure of the manifest processing equipment. In this case, a cargo listing or floppy disks containing manifest information must accompany the load.

NOTE: Computer generated load plans are not an acceptable substitute for proper cargo documentation described above.

13.4.1.4. Make every effort to exchange tiedown equipment on a one-for-one basis. If this is not possible, annotate the AF IMT 4069, **Tiedown Equipment Checklist**. At non-AMC stations, 463L pallets will normally be exchanged on a one-for-one basis.

13.4.1.5. Fleet Service Checklist.

13.4.1.5.1. Aircrew members will make every effort to ensure that the AF IMT 4128, **Fleet Service Checklist**, is signed by the fleet service representative and placed onboard the aircraft prior to departure.

13.4.1.5.2. At en route locations, annotate the form with the station ICAO code or 3 letter identifier in the appropriate block in section II. Example: aircraft departs Dover AFB transits Ramstein AB and returns to Dover AFB. In section II, column 2, enter ETAR (Ramstein) and the number of items the aircraft arrived with in the appropriate rows. Fleet service will inventory and annotate departure information in column 2, D (departure) block. Fleet service will write station ICAO code, date, print and sign with grade in section I. At stations without fleet service, annotate the appropriate block in section I indicating fleet service was not available.

13.4.1.5.3. Annotate inventory changes in section III. Place item nomenclature, increase/decrease amounts, station, date, and reason for change.

13.4.2. Passenger Missions.

13.4.2.1. Maximize seat availability on all missions. It may be necessary for crews to perform passenger service functions at stations that do not have this capability. These functions include manifesting, anti-hijacking processing, and ensuring visa/passport requirements are met. Do not hesitate to contact 618 TACC/XOGX, Aerial Port Control Center; DSN 779-0350/0355, commercial 618-229-0350/0355, if any questions arise such as to who may travel to specific locations or passport/visa requirements. Aircraft operating within other MAJCOMs which have operational command and control over that aircraft will contact the appropriate AMOCC for specific details.

File a copy of the passenger manifest with the most responsible on-scene agency if there are no base operations, or other agency responsible for filing the manifest.

13.4.2.2. Manifesting. Passenger service or base operations personnel manifest passengers at locations with an AMC passenger processing activity. Passenger Terminal personnel will assign seats.

13.4.2.2.1. The PIC and loadmaster are responsible to ensure all passengers are properly manifested.

13.4.2.2.2. At locations without an AMC passenger processing activity, aircrew will manifest all passengers using DD 2131, **Passenger Manifest**, and leave a copy of the manifest with the flight plan. If not filed with the flight plan, annotate the location of the manifest on the flight plan IAW AFI 11-202V3.

13.4.2.2.3. When the aircrew accomplishes manifesting, anti-hijack-processing will also be completed by the aircrew IAW AFI 13-207.

13.4.2.3. Ensure all food items are removed from the aircraft by fleet service and returned to the in-flight kitchen if an extended delay occurs. Ensure that a copy of AF IMT 129, **Tally In-Out**, is received from fleet to relieve the loadmaster of meal accountability.

13.4.2.4. Complimentary snacks and beverages are authorized on Transportation Working Capital Fund (TWCF) funded missions (including missions flown by the 97 AW, ANG and AFRC missions) for passenger consumption only. Complimentary snacks are not authorized on JA/ATT, Joint Chief of Staff (JCS) exercises, or SAAMs. Record all unused snacks and beverages on AF IMT 129 and return to the in-flight kitchen for turn-in credit.

13.4.2.5. Ensure both ATMs and the APU on the side used to enplane passengers are shut down. (**EXCEPTION:** if passenger buses are parked directly behind the aircraft and passengers will be on/offloaded over the aft ramp, both APUs may be operated.) A passenger service representative or crew member will greet passengers at the bottom of the troop compartment ladder. The troop compartment loadmaster assists in seating passengers. Ensure that only adult, English-speaking passengers are seated in emergency exit rows. Do not seat mothers with infants, children under 15 years old or physically challenged persons in emergency exit rows. Make every effort to seat families together.

13.4.2.6. When children under the age of two are accepted as passengers, their sponsor has the option to either hold the child or place him or her in a Department of Transportation-approved Infant Car Seats (ICS). Although the use of ICS for children processed through AMC-owned or controlled terminals (including gateways) is no longer mandatory, all passengers (duty and space A), regardless of age, are required to be assigned their own seat. This policy will provide an infant and their sponsor with a dedicated seat allowing the use of an ICS at the sponsor's discretion; this mirrors current FAA (commercial) standards. The FAA has banned the use of booster seats, harnesses, and vest child restraints.

13.4.2.6.1. Passengers may hand-carry their ICS. If used, these seats will be secured to a seat using the seat belt. Adults will not hold ICS during any phase of flight.

13.4.2.7. Every effort shall be made to transport passengers with disabilities who are otherwise eligible to travel. Passenger service personnel and crewmembers shall provide assistance in loading, seating and unloading disabled passengers. Travel may be disapproved by the chief of passen-

ger travel section or the PIC if there is an unacceptable safety risk to passengers and crew; or if operational necessity or equipment or manpower limitations preclude accepting disabled passengers. Such instances shall be rare and the passenger travel section will ensure the passenger understands why they have been refused air transport on the mission in question. (**EXCEPTION:** Travel shall be approved if a disabled passenger is accompanied by a sponsor or dependent that can assist in his or her needs, if such assistance will eliminate the reasons for denying travel.)

13.4.2.8. Download baggage of no-show passengers or those removed from a flight. For SAAM or exercise missions at non-AMC locations, coordinate with Tanker Airlift Control Elements or deploying unit commanders to decide if downloading baggage is necessary.

13.4.2.9. RUSH baggage movement will be accomplished IAW AMCI 24-101V15, *Military Airlift – Baggage Service*. The loadmaster will ensure ATOC provides a copy of the AMC IMT 70, **RUSH Baggage Manifest**, for the shipment of rush baggage.

13.5. Passenger Handling.

13.5.1. The loadmaster is the key to good passenger relations. The following common sense rules should be observed:

13.5.1.1. Address passengers by proper titles.

13.5.1.2. Avoid arguments and controversial subjects, national or international politics, criticism of other personnel or organizations.

13.5.1.3. Offer services or perform duties in a manner indicating a personal interest and willingness to help.

13.5.2. Comments by the loadmaster and the manner in which they are made, often determine passenger attitudes about the flight. Always remember that passengers are individuals; address them collectively only when making announcements.

13.5.3. In-flight Procedures.

13.5.3.1. Two loadmasters are required in the troop compartment for all takeoffs and landings when passengers are transported in this compartment.

13.5.3.2. Passengers may move about the compartment after reaching cruise altitude. Exercise good judgment on the number of passengers allowed out of their seats at any one time. Encourage passengers to remain seated with their seat belts fastened.

13.5.3.3. Make frequent checks on the following:

13.5.3.3.1. Cabin temperature.

13.5.3.3.2. Passengers with small children.

13.5.3.3.3. Cleanliness of the compartment and lavatories.

13.5.3.4. Do not allow passengers to lounge on or tamper with emergency equipment. Passengers will not be permitted access to checked baggage.

13.5.3.5. Make every effort to make passengers comfortable. Dim overhead lights and extinguish unnecessary compartment lights.

13.5.3.6. Passengers may only visit the flight deck when approved by the PIC. Use good judgment when requesting this authority. See **Chapter 5** for restrictions.

13.5.4. Meal Service.

13.5.4.1. Meals are served at normal hours, when practical, based on the local time at point of departure. Avoid waking passengers to offer meals. Ask the PIC about expected flight conditions prior to meal preparation.

13.5.4.2. Passengers with AMC 148, **Boarding Pass/Ticket**, displaying purchased meals are served in the following sequence:

13.5.4.2.1. Small children requiring assistance.

13.5.4.2.2. Distinguished Visitors (DVs).

13.5.4.2.3. All other passengers.

13.5.4.2.4. The recommended routine is to serve passengers nearest the galley first and continue toward the front of the compartment. This enables the loadmaster to collect empty trays on return trips to the galley.

13.5.4.3. Use the following procedures for box lunches:

13.5.4.3.1. After takeoff, distribute box lunches to passengers who boarded at the previous station. This lessens confusion when flight segments are short and more passengers board at subsequent stations.

13.5.4.3.2. Ensure each passenger receives the meal they ordered by verifying the passenger's AMC 148.

13.5.4.4. Do not serve liquids or hot food during turbulence.

13.5.4.5. Turn in all meals unfit for consumption to the next in-flight kitchen. If in radio contact with the issuing station, relay aircraft tail number, mission identifier, number of spoiled meals (by menu), issuing organization, and in the case of frozen meals, the manufacturing agency, and manufacturer's lot number.

13.5.4.6. When purchased meals are not furnished to passengers, the loadmaster will annotate the individual's boarding pass to reflect reimbursement is authorized. Inform passengers they may receive refunds at the next station or the originating or destination terminal.

13.6. Over-Packed Meal Procedures:

13.6.1. Sign for over-packed inflight meals and supplements delivered to the aircraft. These meals have been inventoried and annotated showing the total number of meals in each container. Do not open containers for inventory.

13.6.2. Obtain sufficient blank copies of AMC 305, **Receipt for Transfer of Cash and Vouchers**.

13.6.3. At the onload station, contact the troop commander or individual responsible for the mission. The user is responsible for collecting for the meals before onload and turning the money over to the loadmaster with two separate listings. One listing of those not on separate rations (authorized government meal at no charge) and another listing of those on separate rations (pay for their meals). Both

listings must be certified. The loadmaster will ensure the cash total is correct and issue a receipt, AMC 305, to the user.

13.6.4. Turn-in money and both listings to the next in-flight kitchen. If the in-flight kitchen refuses to accept the money or meals, have the PIC report the name, rank, date, time, and location through channels on AMC IMT 54. (See **Chapter 8** for instructions for processing this form.) In this case, retain the money and meals and turn them in to the next available in-flight kitchen. When a crew change occurs and the money or meals are transferred to the outbound loadmaster, the inbound loadmaster will retain the signed receipt as proof of money or meals transfer.

13.7. En-route and Post Flight Duties.

13.7.1. At stations where a crew change is made and loading or offloading is required, the inbound loadmaster is responsible for offloading the aircraft. The outbound loadmaster is responsible for planning and loading the outbound load.

13.7.2. Assist passengers to deplane. If BLUE BARKS, COIN ASSIST, DVs or couriers are aboard, the loadmaster will inform the aerial port representative.

13.8. Loaded Weapons. Weapons are considered loaded if a magazine or clip is installed in the weapon, even if the clip or magazine is empty.

13.8.1. Personnel who will engage an enemy force immediately upon arrival (actual combat) may carry basic combat loads on their person. Weapons will remain clear with magazines or clips removed until immediately prior to exiting the aircraft. The troop commander will coordinate with the loadmaster prior to directing personnel to load any weapons. This applies to airborne assaults and airland missions.

13.8.2. Personnel who will not immediately engage an enemy force will store basic ammunition loads in a centralized location for re-distribution after arrival at the objective. Magazines or clips will not be inserted into weapons.

13.9. Weight and Balance. Accomplish weight and balance IAW to T.O. 1-1B-50, *Weight and Balance*, and Addenda A of this AFI. The unit possessing the aircraft maintains the primary weight and balance handbook containing the current airplane status and provides a supplemental weight and balance handbook for each airplane. Enclose the supplemental handbook in a wear-resistant binder (preferably metal), stenciled "Weight and Balance" with the airplane model and complete serial number on the cover or spine.

13.9.1. The supplemental handbook will include the loading data manual, Addendum A, sufficient copies of DD 365-4 to complete the mission and a certified copy of the current DD 365-3, **Chart C-Basic Weight and Balance Record**. Chart C will include the airplane's basic weight, basic moment, and center of gravity.

13.9.2. The weight and balance section of the unit possessing the airplane will maintain the required documents.

13.9.3. Obtain the total fuel weight from the flight engineer or read directly from each gauge and compute the total fuel weight. Do not rely on the fuel totalizer gauge.

13.9.4. The Loadmaster will turn in the original DD 365-4 to be filed at the departure airfield and maintain a physical or electronic copy for the duration of the flight.

13.10. Cargo Validation Onloading and Offloading Procedures and Format. To assist in the cargo validation process, use the following format. After completion, send through standardization channels to HQ AMC/A3V. Use this format when tasked to validate a new loading procedure or when encountering any cargo that requires special or specific onloading, offloading or tiedown procedures not currently listed in T.O. 1C-5A-9-2.

13.10.1. General Loading Data:

13.10.1.1. Nomenclature of item. Give military or civilian name, national stock number (NSN), and a brief description of the item, i.e., dump truck, medical van, etc.

13.10.1.2. Dimensions (in inches). Include length, width, and height. Rough drawing or picture of the unit, pointing out critical dimensions, projections, overhangs, etc.

13.10.1.3. Weight (in pounds). Include gross weight; individual axle weight; or data plate weight if possible.

13.10.2. Number of loading crew personnel and loadmasters required to onload or offload cargo and their position to observe clearances, if required.

13.10.3. Equipment and Material Requirements. Special equipment and material required to onload and offload cargo, i.e., cargo winch, prime mover, shoring requirements.

13.10.4. Required aircraft configuration.

13.10.5. Preparation of Cargo for Loading. Components that must be removed or reconfigured to onload and offload cargo, i.e., helicopter struts, exhaust stacks, cabs, etc.

13.10.6. Loading Procedures.

13.10.7. Location of Tiedown Points.

13.10.8. Offloading Procedures.

13.10.9. Comments.

13.11. Emergency Airlift of Personnel: The following procedures will apply to ensure a safe, efficient loading method for the emergency airlift of personnel and aeromedical evacuation (AE) of litter patients from areas faced with enemy siege or hostile fire, humanitarian evacuations, or when directed by MAJ-COM/DO through C2.

13.11.1. Emergency airlift of personnel will normally be accomplished without the use of individual seats or seat belts. Evacuees will be seated on the cargo compartment floor and restrained with tiedown straps. Approximately 600 evacuees can be transported in this configuration, but can vary depending on individual sizes. Loading procedures and actual placement of evacuees will be determined by the loadmaster and PIC.

13.11.2. See [Chapter 18](#) for procedures pertaining to AE of medical patients.

13.11.3. Maximum altitude for emergency airlift of personnel is FL 250.

13.12. Rucksacks: Loadmasters will use the following procedures for units that deploy with rucksacks:

13.12.1. During tactical deployments into a forward operating base (FOB) or objective base (OB), the individual will carry rucksacks onto the aircraft. Allocate floor space on the aircraft load plan for floor loading rucksacks.

13.12.2. During administrative deployments, rucksacks will be loaded on deploying vehicles, palletized, or floor loaded.

13.12.3. In all cases, load rucksacks on the same aircraft as the individual.

13.13. Flight Station and Troop Compartment Access: During loading operations, do not place cargo in a position that will restrict the use of the flight station or troop compartment stair ladders during flight.

13.14. Not Used.

Chapter 14

FUEL PLANNING

14.1. General. In conjunction with AMCPAM 11-2, *C-5 Fuel Planning*, this chapter provides fuel planning policy and procedures for C-5 operations. It is designed to assist aircrews in fuel planning for airland, low level, and air refueling missions.

14.2. Scope. The provisions of this chapter apply to all AETC, AMC, and ARC personnel responsible for C-5 fuel planning.

14.3. Distribution. Distribute this chapter to all personnel responsible for flight and fuel planning of air-lift missions. Maintain this chapter in AMC Command Posts and AMC airlift coordination centers.

14.4. General Planning. Aircrews will fuel plan using AMCPAM 11-2. Normal cruise speed for the C-5 is 300 KCAS/.77 M, whichever is less. Use Fuel Planning requirements in [Table 14.1](#).

Table 14.1. Fuel Planning Requirements.

Start, Taxi, Run-Up, APU, and Takeoff	3,000	When more than 15 minutes taxi time is anticipated, add 120 pounds per minute, not to exceed 5,000 pounds total.
En Route		Fuel for flight time from departure to begin descent point (BDP) at cruise altitude profile.
En Route Reserve		10 percent of flight time fuel over a category I route/route segment, not to exceed 1+00 fuel at normal cruise.
Alternate		Fuel for flight time from OH destination to alternate, or to most distant alternate when two are required, at the speed and altitude from the alternate fuel chart. Compute using OH destination GW (takeoff GW minus blocks 3, 7a, and missed approach fuel, if applicable).
Missed Approach	8,000	Required if destination is below ceiling minimums, but at or above visibility minimums.
Holding		+45 fuel computed from holding chart. When an alternate is unavailable, located in Alaska, or at latitudes greater than 59 degrees, use 1+15. compute using OH alternate GW (takeoff GW minus blocks 3, 4 and 7a).
Descent, Approach, and Landing	7,000	When manually flight planning, add 15 minutes and 5000 pounds of fuel to fuel overhead destination for approach and landing.
Known Holding Delays		Computed from holding chart for expected duration of holding.

Off Course Maneuvering	600/min	Departure. Terrain clearance, thunderstorm avoidance, and air traffic control (ATC) requirements.
	400/min	Cruise. Thunderstorm avoidance and ATC requirements. NOTE: In both cases, compute fuel based on anticipated increase in flying time not time spent maneuvering off course.
Insufficient and Unreliable NAVAIDs	5,000	At destination airfield.
Engines Running Onload and Offload	100/min	
Hydraulic Cooling		Plan to land at destination with minimum of 18,000 pounds to comply with requirements of TO 1C-5A-1. If block 13 of AF 4053 (block 56, AF 4052) is less than 25,000, add fuel to block 7b (block 51, AF 4052) equal to the difference between block 13 or (block 51, AF 4052) and 25,000. For in-flight diversions and fuel management, only block 13 (block 51 on AF 4052) fuel is required.
Subsequent Mission Segments		Add fuel when unavailable at en route stops, compressed ground times during single day, multi-sortie missions preclude refueling, or if en route refueling would delay or be detrimental to mission accomplishment. Fuel tankering merely for convenience is not authorized. NOTE: When deemed financially prudent by the aircrew or mission planners, aircrews may tanker fuel when transiting airfields without DoD or DoD contract fuel. The decision to tanker fuel should be based on careful analysis of mission requirements and limiting factors.

NOTE: Fuel figures are in pounds.

14.4.1. Fuel requirements are in [Table 14.1](#). If decompression would cause descent to an altitude resulting in fuel consumption exceeding planned fuel, add fuel to recover at a suitable airfield from equal time period (ETP) at the appropriate altitude using guidance in AMCPAM

11-2. This is not required if the aircraft can recover to a suitable airfield at FL 250 at long range cruise (LRC) speed from ETP.

14.4.2. Fuel conservation. Aircrew and mission planners will manage aviation fuel as a limited commodity and precious resource. Fuel optimization will be considered throughout all phases of mission planning and execution. Excessive ramp and recovery fuel adds to aircraft gross weight and increases fuel consumption. Do not ferry extra fuel beyond optimum requirements for safe mission accomplishment and training objectives. Aircrew and mission planners will optimize flight plans and flight rout-

ing for fuel efficiency. In-flight procedures such as climb/descent profiles and power settings should also be considered for efficient fuel usage.

14.4.2.1. Aircrew should employ the following aviation fuel optimization measures without compromising flight safety or jeopardizing mission/training accomplishment:

14.4.2.1.1. Optimize fuel loads. Mission plan for the required ramp and recovery fuel. Ensure ramp fuel is correct upon arrival at aircraft.

14.4.2.1.2. Minimize use of APUs. Use ground power units when practical.

14.4.2.1.3. Delay engine start time. Establish and implement local engines start time standards.

14.4.2.1.4. Minimize aircraft weight through optimized fuel loads and reduction of equipment not necessary to accomplish the mission.

14.4.2.1.5. Establish C2 and flight following procedures to ensure timely notification of mission changes/cancellations to avoid unnecessary or unproductive flight time.

14.4.3. Fuel Loads:

14.4.3.1. Canned fuel loads will not be used and final servicing will be delayed until accurate fuel requirements are known.

14.4.3.1.1. Aircraft do not require defueling if the fuel load is 60,000 pounds or less.

14.4.3.1.2. DELETED

14.4.3.2. Units will not plan locals with fuel loads exceeding 220,000 pounds. Use the minimum fuel load necessary for training and airframe utilization requirements. Plan to terminate local missions with not less than 20,000 pounds.

14.4.4. Flight Manger Fuel Calculations. The Flight Manager uses the AMC approved Advance Computer Flight Planning (ACFP) system to create and calculate the flight plan included in the Departure Papers. ACFP's fuel calculation factors and defaults are approved by HQ AMC/A3V. ACFP uses digitized T.O. 1C-5A-1-1 flight performance modules to perform CFP calculations. This process produces a flight plan that is highly accurate and does not normally require extra fuel. Therefore, it is imperative that aircrews understand and comply with the planned route and flight profile.

14.4.4.1. Weather. "CL" indicates that the CFP is based on climatological data; "GB" indicates that the CFP is based on AFWA global forecast weather. CFPs provided for flight managed sorties in Aircrew Departure Papers, will normally be based on the current weather forecast from AFWA and routes will be planned around significant en route weather. Therefore, en route winds and temperature deviation are based on the latest forecast available at planning time. The Date/Time shows the valid time of the weather four hours before ETD and four hours after ETD.

14.4.4.2. Category I Routes. In the route summary of the CFP category 1 route segments are identified by the "&" sign to the right of the waypoint name. The first time the "&" appears is the start of a CAT 1 route; the second time designates the end of the CAT 1 route. 10% of the total time between these points is shown in item 2 - RESERVE of the fuel summary section of the CFP, with the resultant fuel required.

14.4.4.3. See [Table 14.2.](#) for ACFP fuel calculation block definitions.

Table 14.2. ACFP Fuel Calculations

1	EN ROUTE	Time and Fuel from total time to decent point
2	RESERVE	10% of flight time fuel over a Category 1 route/ route segment, not to exceed 1 hour
3	EN ROUTE + RESERVE	Total of 1 and 2
4	ALTERNATE	Time and fuel from missed approach at the destination to overhead the alternate
5	HOLDING	Computed fuel based on gross weight at alternate for either 45 minutes or 1+15 hours with altitude based on aircraft default and destination. Automatically uses long holding for island alternates, Alaska, and latitudes greater than 59 degrees
6	APP & LANDING	Computed fuel for approach and landing based on time from descent point to destination and includes defaulted approach bias listed in aircraft defaults
6A	AR ONLD/OFFL	Fuel on/offloaded during an air refueling portion of flight
7A	IDENTIFIED EXTRA	Extra fuel identified by user input as either identified or ramp fuel specified over the calculated ramp. If the user specifies a ramp fuel in the input and the calculated fuel for the flight is less, the delta fuel is shows as extra fuel
7B	STORED FUEL	Fuel in this block is the fuel required for follow-on legs in a Complex, Complex, Last flight plan request. This is used to calculate multiple legs of a mission that do not have a ground refueling planned
8	SUBTOTAL	Total time and fuel of blocks 3, 4, 5, 6, 6a, and 7(a & b)
9	TAXI	Defaulted taxi fuel as found in the aircraft defaults
10	REQD RAMP	Total of 8 and 9. Ramp fuel required for the flight. If the flight planner designates a ramp fuel, this block will reflect that input
11	ACTUAL RAMP	Blank unless provided to the FM by the departure station
12	UNIDENTIFIED EXTRA	Any fuel not identified previously
13	REQD O/H DEST	Total fuel of blocks 4, 5, and 6
14	ENDRUANCE/ DEST	Total flight time capable with fuel remaining overhead destination
15	TOTAL ENDURANCE	Total flight time possible with block 10 fuel
16	B/O (Burn Off)	Total of blocks 1 and 6

14.4.4.4. Cruise Altitude. FMs normally calculate the CFP using step climb profile IAW with AMC directive. If route or mission requirements dictate a specific altitude/FL profile, the FM will include it in the calculation.

14.4.4.5. Alternate Planning. FMs normally request two alternates on the CFP unless the operations directives dictate more than two. ACFP calculates a direct route to the alternates unless a specific route to the alternate is required/specified. Since the FM does not know when the divert to the alternate will begin, a route is not normally specified. Therefore, conservative fuel planning for the alternate dictates that aircrews use the required Block 10 fuel to the most distant alternate. FMs plan long holding fuel for remote or island destinations where no viable alternate is available.

14.4.4.6. The following fuel planning factors are not automatically included in the CFP as calculated by the FM: off-course maneuvering; ERO fuel; fuel for anti-icing operation; and a second approach and landing fuel when planning to a destination with visibility only minimum weather forecast.

14.5. AR Fuel Planning. Use AF 4052, **C-141/C-130/C-5/C-17 Refueling Computations**. A discussion of AR fuel planning can be found in AMCPAM 11-2.

14.5.1. Formatting altitude. If the end refuel tanker weight is unknown, use 400,000 lbs for a KC-10 and 150,000 lbs for a KC-135.

14.5.2. In-flight Fuel Planning. For single and multiple A/R, PICs will ensure recovery fuel requirements and required on-load are computed.

14.5.2.1. Recovery fuel requirement computation. After reaching the cruise altitude and before A/R, estimate the fuel on board at the ARCP and compare this with AF Form 4052 Block 14 or Block 35(for multiple A/Rs) to ensure recovery capability from the ARCP.

14.5.2.2. Fuel on-load confirmation. Approximately 45 minutes before each ARCP, complete the fuel on-load requirements to ensure sufficient fuel is obtained from the tanker.

14.6. Variant Configuration Fuel Planning. The following procedures were developed to standardize fuel planning for variant configurations.

14.6.1. Estimate the flying time for the configuration you have.

14.6.1.1. Use the calibrated airspeed/mach limit from T.O. 1C-5A-1, Section 5, for the configuration you have and convert it to a true airspeed (TAS) using T.O. 1C-5A-1-1 (enter the chart at 25,000-feet).

14.6.1.2. Use the average forecast wind factor (FWF) from the CFP to convert the TAS to ground speed (GS).

14.6.1.3. Apply the ground speed to the total distance remaining to arrive at the total time en route.

14.6.2. Estimate a takeoff gross weight using the following:

14.6.2.1. Flights with a **drag index less than 150** or a takeoff gross weight less than 550,000 pounds.

14.6.2.1.1. 30,000 pounds per hour for the first hour.

14.6.2.1.2. 25,000 pounds per hour for remaining flight time.

14.6.2.1.3. Determine your category I leg reserve fuel:

14.6.2.1.3.1. Cat I Leg Reserve Fuel = (25,000 pounds)(reserve time in minutes)

(60 minutes)

14.6.2.1.4. Alternate fuel: 25,000 pounds per hour.

14.6.2.1.5. Holding fuel: 15,000 pounds.

14.6.2.1.6. Approach and landing: 7,000 pounds.

14.6.2.1.7. Start, taxi, and takeoff: 3,000 pounds.

14.6.2.2. Flights with a **drag index greater than 150** or a takeoff gross weight greater than 550,000 pounds.

14.6.2.2.1. 35,000 pounds for the first hour.

14.6.2.2.2. 30,000 pounds per hour for remaining flight time.

14.6.2.2.3. Determine category 1 leg reserve fuel:

14.6.2.2.3.1. Category I leg Reserve Fuel = $\frac{(30,000 \text{ pounds})(\text{reserve time in minutes})}{(60 \text{ minutes})}$

14.6.2.2.4. Alternate fuel: 30,000 pounds per hour.

14.6.2.2.5. Holding fuel: 20,000 pounds.

14.6.2.2.6. Approach and landing: 7,000 pounds.

14.6.2.2.7. Start, taxi, takeoff: 3,000 pounds.

14.6.3. Using estimated gross weight, obtain a performance ceiling from T.O. 1C-5A-1-1.

14.6.4. Determine the optimum range airspeed and compare it to T.O. 1C-5A-1, Section 5 limits. Use the lower of the two.

14.6.5. Convert the calibrated airspeed/mach to a true airspeed using T.O. 1C-5A-1-1.

14.6.6. Use the forecast wind factor to determine an average ground speed.

14.6.7. Determine the air distance for the entire route.

14.6.7.1. Air Distance = $\frac{(\text{ground distance})(\text{true airspeed})}{(\text{ground speed})}$

14.6.8. Obtain a climb range and climb fuel from T.O. 1C-5A-1-1, and correct for variant configuration.

14.6.9. Subtract the climb range from the total air distance.

14.6.10. Determine the en route fuel requirement using T.O. 1C-5A-1-1, and correct for variant configuration.

14.6.10.1. Fuel Required = $\frac{(1,000)(\text{air distance})}{(\text{air nautical miles per 1,000 pounds of fuel})}$

14.6.11. Determine the Category I fuel reserve. (See step [14.6.2.1.3.1.](#) or [14.6.2.2.3.1.](#))

14.6.12. Compute alternate fuel using step [14.6.6.](#), [14.6.7.](#), and [14.6.10.](#) procedures.

14.6.13. Obtain a holding fuel from T.O. 1C-5A-1-1, and correct for variant configuration.

14.6.14. Approach and landing fuel: 7,000 pounds.

14.6.15. Start, taxi and takeoff: 3,000 pounds.

NOTE: This procedure requires the use of estimates to get started. The estimates are general and were developed to cover a wide range of situations. Consequently, you may need to run the procedure twice to refine the fuel load.

14.7. Low-Altitude Fuel Planning. Charts and procedures are published in AMCPAM 11-2. Low-altitude mission fuel planning will be accomplished on AF 4050, **Tactical Mission Fuel Planning (C-5)**.

14.8. Not used.

Chapter 15

AIR REFUELING (AR)

15.1. General. This chapter establishes procedures for aircrews to air refuel the C-5 and is in addition to procedures in the flight manual, and air refueling manual.

15.2. A/R Limitations. The following limitations apply

15.2.1. Tanker Autopilot. Tanker pilots will notify receiver pilots when any axis of the autopilot is not used. If the tanker copilot is required to fly autopilot-off for training, unqualified receiver pilots will not fly the aircraft (N/A FTU). Tanker pilots will notify the receiver when copilot autopilot-off training is conducted and receive confirmation that the receiver pilot flying the aircraft is qualified.

15.2.2. A/R Without Tanker Disconnect Capability. Without tanker disconnect capability means the boom operator cannot trigger an immediate disconnect. A/R will not be conducted after a loss of tanker disconnect capability.

EXCEPTION 1: Fuel emergency situation.

EXCEPTION 2: Contingency missions, JCS alert, ORI or CORI, Prime Nuclear Airlift Force (PNAF) support missions under normal conditions when the refueling is essential for home base recovery, or for any mission when authorized.

NOTE: When conducting A/R without tanker disconnect capability, limit contacts to the minimum number necessary to complete mission requirements. Do not accomplish boom limit demonstrations, or practice emergency separations while in the contact position.

15.2.3. Manual Boom Latching (MBL) (also referred to as Emergency Boom Latching (EBL), Override Boom Latching (OBL) and amplifier override). This is an emergency procedure. Normal tanker disconnect capability and automatic disconnect limits are inoperative. Use of this procedure must be authorized in the mission directive.

NOTE: The boom operator and receiver pilot will coordinate all actions as required by applicable directives and checklists when making A/R contacts using emergency boom latching procedures.

15.2.4. Reverse A/R procedures will be accomplished for operational necessity only.

15.2.5. Emergency Separations/Breakaways. Follow procedures in IAW T.O. 1C-5A-1. When separation between receiver and tanker has been effected, the receiver pilot advises the tanker "WELL CLEAR" and states altitude passing. When the situation has stabilized, coordinate clearance back to precontact. Restrict all emergency separations/breakaways to 1000' below individual tanker's altitude.

15.2.6. Practice Emergency Separations:

15.2.6.1. Prior to the actual accomplishment of a practice emergency separation, coordination between the tanker pilot, boom operator, and receiver pilot is mandatory. Coordination will include when the separation will occur and who will give the command of execution.

15.2.6.2. Prior to initiating practice emergency separations from the contact position, the receiver will ensure their A/R system is not in the override mode.

NOTE: Practice emergency separations will terminate no lower than 1000' below tanker altitude.

15.2.7. Receiver A/R Training for Unqualified Receiver Pilots. (This includes copilots, aircraft commander upgrade candidates and aircraft commanders refueling from the right seat.) In-flight training will be accomplished under direct IP supervision. The following procedures apply:

15.2.7.1. The receiver pilot will inform and receive acknowledgment from the tanker. The boom operator at the controls will be qualified for the applicable category receiver. (This restriction does not apply during FTU training provided the student boom operator is under direct instructor supervision.)

15.2.7.2. For receiver pilot initial qualification or requalification, the receiver instructor / examiner pilot will be in one of the pilot seats with immediate access to the controls through all phases of the refueling from pre-contact until post air refueling.

15.2.8. If a change of pilot control is made, the receiver aircraft will move back to at least the pre-contact position except for immediate assumption of control by the instructor pilot.

15.2.9. If a receiver seat change takes place, move back to at least 100 feet in trail of the tanker and to a point where the receiver pilot can maintain visual contact with the tanker until the seat change is complete.

15.2.10. When conducting A/R behind a KC-135, tanker disconnect capability will be demonstrated by a boom operator initiated disconnect before conducting a limit demonstration or a practice emergency separation from the contact position.

15.2.11. Weather Limitations.

15.2.11.1. Turbulence: Do not launch if severe turbulence is forecast on the refueling track. Terminate refueling if moderate turbulence is encountered.

15.2.11.2. Visibility: Do not close from 1 NM range (2 NM for receiver or tanker formations) unless you have visual contact with the tankers. Discontinue refueling if in-flight visibility is insufficient to continue safe refueling operations.

15.2.11.3. A/R alternate airfields must meet the criteria of AFI 11-202V3 for alternate airports.

15.2.12. NVG Use During A/R. Pilots may use NVGs during air refueling rendezvous to acquire the tanker but must remove goggles NLT one nautical mile from the tanker.

15.3. Communications Failure. Aircraft experiencing two-way communications failure during the conduct of A/R shall continue flight in accordance with the following procedures:

15.3.1. Squawk code 7600 for at least 2 minutes before exiting the track or anchor.

15.3.2. Aircraft that have not received altitude instructions beyond the exit point shall exit the track or anchor at the lowest altitude specified in the clearance for the refueling portion of the flight and proceed in accordance with "Procedures for Two Way Radio Failure IFR-VFR" set forth in DOD Flight Information Handbook.

15.4. Operational Reporting. Air refueling command and control reporting will be in accordance with [Chapter 2](#) of this instruction.

15.5. MARSA Applicability for Aerial Refueling. MARSA begins between the tanker and receiver when the tanker advises ATC that it is accepting MARSA. MARSA is not an ICAO recognized term. If in doubt as to what separation is provided by ATC, or what separation the aircrew is responsible for, query the tanker and/or controlling agency.

15.5.1. If MARSA has not been accepted by the tanker before the receiver reaches the air refueling initial point (ARIP), the receiver may be required to hold at the ARIP.

15.5.2. Once the rendezvous is completed, headings and altitude assignments may be made with the tanker concurrence with MARSA remaining in effect.

15.5.3. Upon completion of the rendezvous, receiver aircraft will remain within 3 miles of the tanker until MARSA is terminated.

15.5.4. MARSA ends when normal separation standards are established, ATC accepts control at end of refueling and ATC advises MARSA is terminated.

15.6. Altitude Reservations. An ALTRV is authorization by a central altitude reservation function (CARF, EUCARF, PACMARF, CARU) or the appropriate ARTCC/CERAP under certain circumstances, for airspace utilization under prescribed conditions. Air refueling on operational missions often utilizes an ALTRV under these conditions. ALTRVs may include all, a portion, or portions of the intended route of flight. Request and approval format can be found in FAA 7610.4J.

15.6.1. PICs will ensure ALTRV approval is received prior to mission execution. ALTRV status may be verified through the appropriate 618 TACC cell.

15.6.2. Aircraft must depart within the assigned AVANA (ALTRV Void if Aircraft Not Airborne) time for the purpose of providing separation between altitude reservations. Normal AVANA will be 30 minutes. If a mission is to be delayed beyond the AVANA time, coordinate with the C2 authority as soon as possible. Rescheduling will normally be in 24-hour increments after the original schedule.

15.6.3. Aircraft on an ALTRV must operate within the altitude, time, and areas specified in the approval. An ALTRV APVL authorizes the aircraft to climb or descend as specified. Controllers are not required to issue a climb or descent clearance for the various flight segments. They may, however, request that the pilot advise them prior to initiating an altitude change.

15.6.4. In a non-radar environment, the aircraft shall advise ATC if actual fix timing will be more than plus or minus 5 minutes from the planned ALTRV en route fix estimate.

15.6.5. File flight plans (1801 or DD175) containing ALTRVs IAW FLIP GP. Include the name of the ALTRV in the remarks section of the flight plan. ALTRV requests or approvals do not eliminate the responsibility to obtain proper diplomatic clearance or file flight plans.

15.7. Receiver Aircraft Commander Responsibilities.

15.7.1. Squawking normal when separation from the tanker is greater than 3 miles.

15.7.2. Maintaining two-way radio contact with ATC until cleared to the refueling block altitude, established in that block, and cleared to the A/R frequency by ATC.

15.7.3. Receiver pilots are reminded that oceanic clearances and readback are required for all flights within North Atlantic (NAT) controlled airspace. References for oceanic clearance procedures are

FLIP Area Planning (AP)/2 and NAT Minimum Navigation Performance Specification (MNPS) Manual.

15.7.3.1. Receiver pilots will not rely on the tanker to obtain and readback oceanic clearance. To the maximum extent possible, receiver pilots should obtain their own, individual clearance from the oceanic control authority of the airspace in which they intend to operate, prior to entering oceanic airspace. Pilots will request oceanic clearance prior to oceanic entry point IAW procedures established in AP/2 and NAT MNPS Manual. Consider obtaining clearance and providing readback prior to rendezvous and air refueling.

15.7.3.2. Tanker aircraft will not accomplish clearance readback for receiver aircraft. Receiver PICs are responsible for ensuring that oceanic clearance is always readback, and acknowledged by the oceanic controlling authority, prior to entering oceanic airspace.

15.8. Tanker Aircraft Commander Responsibilities. Tanker ACs are responsible for:

15.8.1. Remaining within the protected lateral, longitudinal, and vertical airspace of the refueling track or anchor including orbit patterns.

15.8.2. Notifying the appropriate ATC facility of all altitudes vacated and not anticipated for further use by refueling aircraft. Such altitudes shall not be reoccupied without further ATC clearance.

15.8.3. Receiver navigation, regardless of the number of tankers or receivers, after rendezvous completion through completion of refueling operations (A/R and MARSA have been terminated) except when under control responsibility of a military radar facility while in an anchor area.

15.8.4. Maintaining communications with the appropriate ATC facility. All communications during refueling operations, including those concerning the receivers, shall be between the ATC facility or military radar unit and tanker. To the extent practical, receivers shall establish communications with the tanker prior to or when departing the ARIP on the specified A/R frequency. The tanker shall assume position reporting responsibility for the receivers upon rendezvous completion.

15.8.5. Coordinating altitude and route clearance:

15.8.5.1. From the ATC facility for receivers and tanker at least 5 minutes prior to refueling completion except when both aircraft are operating on an approved altitude reservation (ALTRV).

15.8.5.2. Through the radar controller when operating in refueling anchors with military ground radar. At least 5 minutes prior to completing refueling operations, the military radar facility shall forward requests to the assigned ATC facility and subsequently relay ATC clearances for the tanker and receiver aircraft from the ATC facility.

15.8.5.3. Tanker aircrews should not normally obtain oceanic clearances for receiver aircraft intending to operate in NAT oceanic airspace. This is a receiver AC responsibility.

15.8.5.4. Tanker aircrews will not readback receiver aircraft oceanic clearance. This is a receiver AC responsibility.

15.8.6. Vertically positioning aircraft prior to reaching the planned exit point, to facilitate the safe and efficient transfer of separation responsibility from the military, under the provisions of MARSA, to the ATC facility on completion of refueling operations. Vertical separation of receivers and tankers shall be accomplished within the assigned altitudes.

15.8.7. Providing each receiver, upon request, with the aircraft's position at the completion of refueling operations. Additional information concerning amendments or changes to the receiver's ATC clearance shall also be provided as appropriate.

15.8.8. Coordinating all refueling formation operations to ensure all aircraft are in proper post air refueling formation prior to cell breakup. Prior to terminating air refueling, the lead tanker will confirm all aircraft in the formation are in proper post air refueling position with required lateral/vertical separation.

15.9. ATC Clearance. A/R operations are normally conducted on tracks or anchor areas published in DOD FLIP. Operational considerations may require A/R outside published areas or within an ALTRV. The tanker aircraft commander shall receive specific ATC clearance from the appropriate ATC facility for the following:

15.9.1. Entry to/exit from assigned aerial refueling altitude block (except on an approved ALTRV).

15.9.2. Altitudes requested for tanker and receiver aircraft upon completion of air refueling.

15.9.3. Routing for each aircraft or formation flight when exiting the refueling track prior to or beyond the exit point, or different from the flight plan routing.

15.9.4. Extending the refueling operations beyond the track or anchor exit point due to adverse winds, mission requirements, etc.

15.9.5. Use of altitudes in excess of those for which specific clearance has been granted (i.e., tobogganing).

Chapter 16

COMBAT MISSION PLANNING

16.1. General. This chapter provides combat mission planning guidance for planners and aircrews, standardizing procedures for planning, briefing, and reviewing all missions. Planners and aircrews should reference AFTTP 3-3.35B.

16.2. Mission Planning. The first steps in planning are to analyze the tasking, gather all pertinent information, and decide what additional support is required. Having this information on hand before developing the detailed plan will save time in the long run. Planners will thoroughly study en route threats, terrain, ingress and egress routes, target areas, operations and communications security (OPSEC and COMSEC), political and cultural characteristics, climatology, and any other factors that enhance mission success. Intelligence and meteorology and/or climatology requirements will be identified early because this information may not be readily available. Mission support requests will also be processed as soon as possible to allow coordination and planning. The level of coordination is dependent on available time and means of communication. Aircrews will be ready to operate in the joint arena with little or no face-to-face coordination.

16.2.1. Tasking Order Analysis. ATO contents are discussed in AFTTP 3-1. An ATO will task elements of composite forces, provide mission objectives and general guidance, and indicate actions required by individual situations. The AME will normally publish an ATO or air movement schedule (AMS) governing airlift missions planned for the next 24 hours. ATOs and AMSs are normally accompanied by special instructions (SPINS) which provide detailed instructions for composite forces. A standardized ATO format for theater assigned forces can be found in AFP 102-2V1, *Joint Users Handbook—US Message Text Format (JUH-USMTF)*, Air Tasking Order/Confirmation (ATO-CONF), and AFTTP 3-1V1. Airspace control procedures may be implemented in the ATO, SPINS, or published in a separate Airspace Coordination Order (ACO). Planners and aircrew will understand and comply with all aspects of current airspace control procedures. The following items should be extracted from the ATO:

16.2.1.1. Mission number.

16.2.1.2. Security classification.

16.2.1.3. Tasking organization.

16.2.1.4. Concept of operations and mission description to include type of mission, assault zone description, required aircraft and aircrews, and participating forces and units.

16.2.1.5. Schedule of events.

16.2.1.6. Rules of engagement (ROE).

16.2.1.7. Communications & Electronic Operating Instructions (CEOI).

16.2.1.8. Special Instructions (SPINS).

16.2.1.9. Command and control instructions.

16.2.1.10. Scheduled airlift support (e.g. JSEAD, AWACS, ABCCC, CAP, etc.).

16.2.1.11. Airspace management procedures, to include IFF/squawks, airspace control center coordination (e.g. ALCC, TACS, AAGS, ATAF), air defense network procedures, prohibited/restricted area procedures, and route deconfliction.

16.2.2. Air Movement Table (AMT). The DIRMObFOR's transportation staff should develop an AMT as an appendix to the ATO to list equipment and personnel that constitute each aircraft load. An abbreviated ATO or FRAG may be issued to subordinate units to further refine the ATO and air movement plan.

16.2.3. Schedule of Events. After receiving formal mission tasking, planners construct a schedule of events checklist to assist in keeping the mission, from planning through execution, on schedule. Some mission events (e.g., TOTs, available CAF support, etc.) will be specified in the tasking document. AFTTP 3-1V1 provides a suggested list of significant mission events.

16.2.4. Intelligence Requirements. Current intelligence is vital. Incomplete or outdated information reduces the probability of success and survivability. Intelligence personnel will be integrated into the planning cell.

16.2.5. OPOrd. An OPOrd usually covers overall concepts of operations and mission requirements to be flown during a future time period (such as a week or more).

16.2.6. Meteorology/Climatology Analysis. Weather information will be included in both planning and briefing functions for all missions. AFTTP 3-1 contains an outline for meteorology/climatology analysis.

16.2.7. Mission Support. Planners need to identify, request, and coordinate additional mission support above that provided in the OPOrd and ATO/SPINS. The point of contact for coordination is the AMD and the DIRMObFOR staff.

16.2.8. Mission Considerations. Review mission considerations IAW AFTTP 3-3.35B

16.2.8.1. DELETED

16.2.8.2. Evasion Plan of Action (EPA). AFTTP 3-3.35B Chapter 2 and AFTTP 3-1 include suggested EPA planning information.

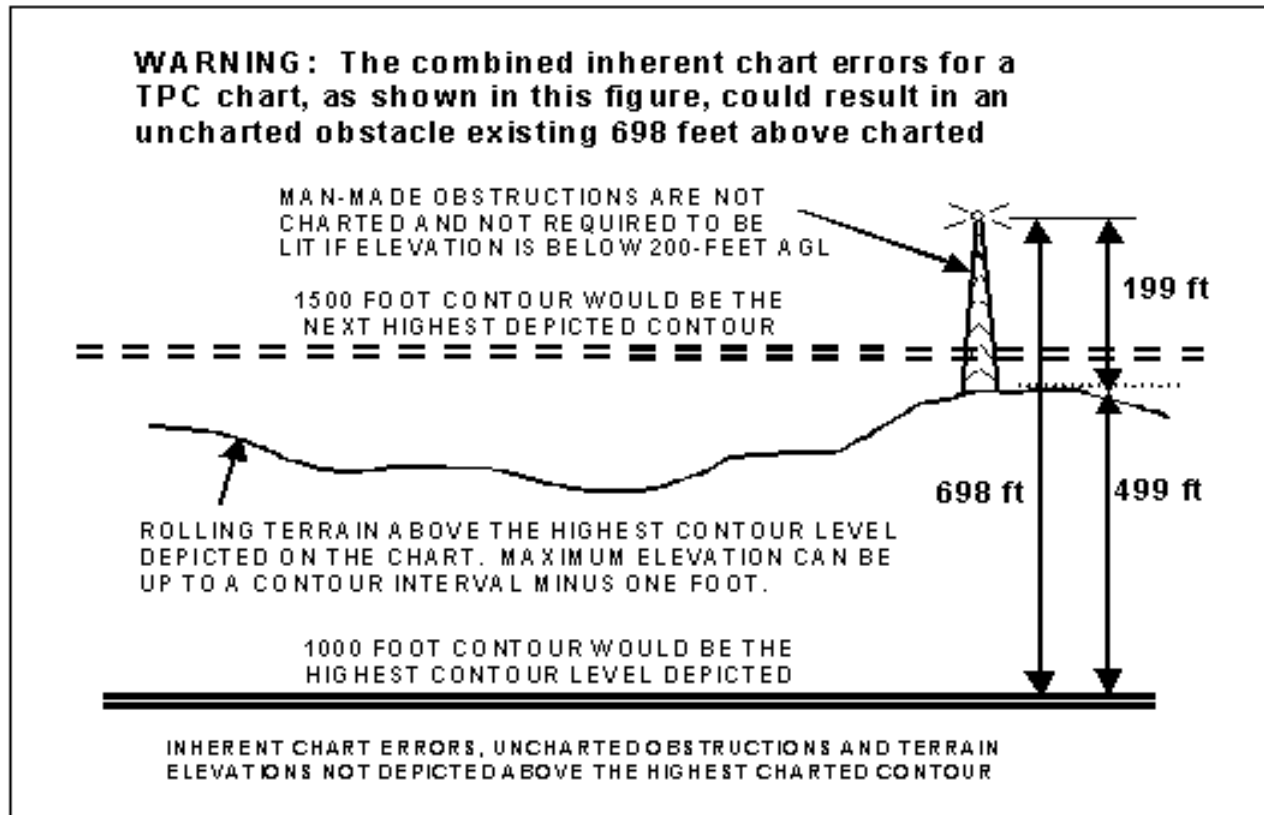
16.3. Route Planning. To the maximum extent possible, crews should follow guidance listed in AFTTP 3-3.35B, chapter 2.

16.4. Low Altitude Restrictions. Low altitudes will depend upon conditions such as terrain, threat, the necessity to avoid detection, and equipment limitations. The following minimum altitudes are established for MAF airlift operations. FLIP/ICAO procedures, training considerations, terrain, or operational directives may dictate higher altitudes.

WARNING: Aeronautical charts do not depict man-made obstacles less than 200 feet AGL or a change in terrain until it exceeds the chart contour interval. The worst situation would occur if a 199-foot tower sat on terrain with an elevation just below the next higher contour. For a TPC (1:500,000) with a contour interval of 500-feet, this results in an uncharted obstacle existing 698 feet above charted terrain. Additionally, the highest spot elevation on any given leg may not be the highest terrain as in the case of gradually rising elevations. Planners will ensure accurate terrain analysis by evaluating both spot elevations and the highest contour level. Refer to **Figure 16.1. Inherent Chart Errors.**

CAUTION: Some charts may depict terrain and obstacle altitudes in meters versus feet (e.g. JOG and TLM charts in some areas of the world).

Figure 16.1. Inherent Chart Errors.

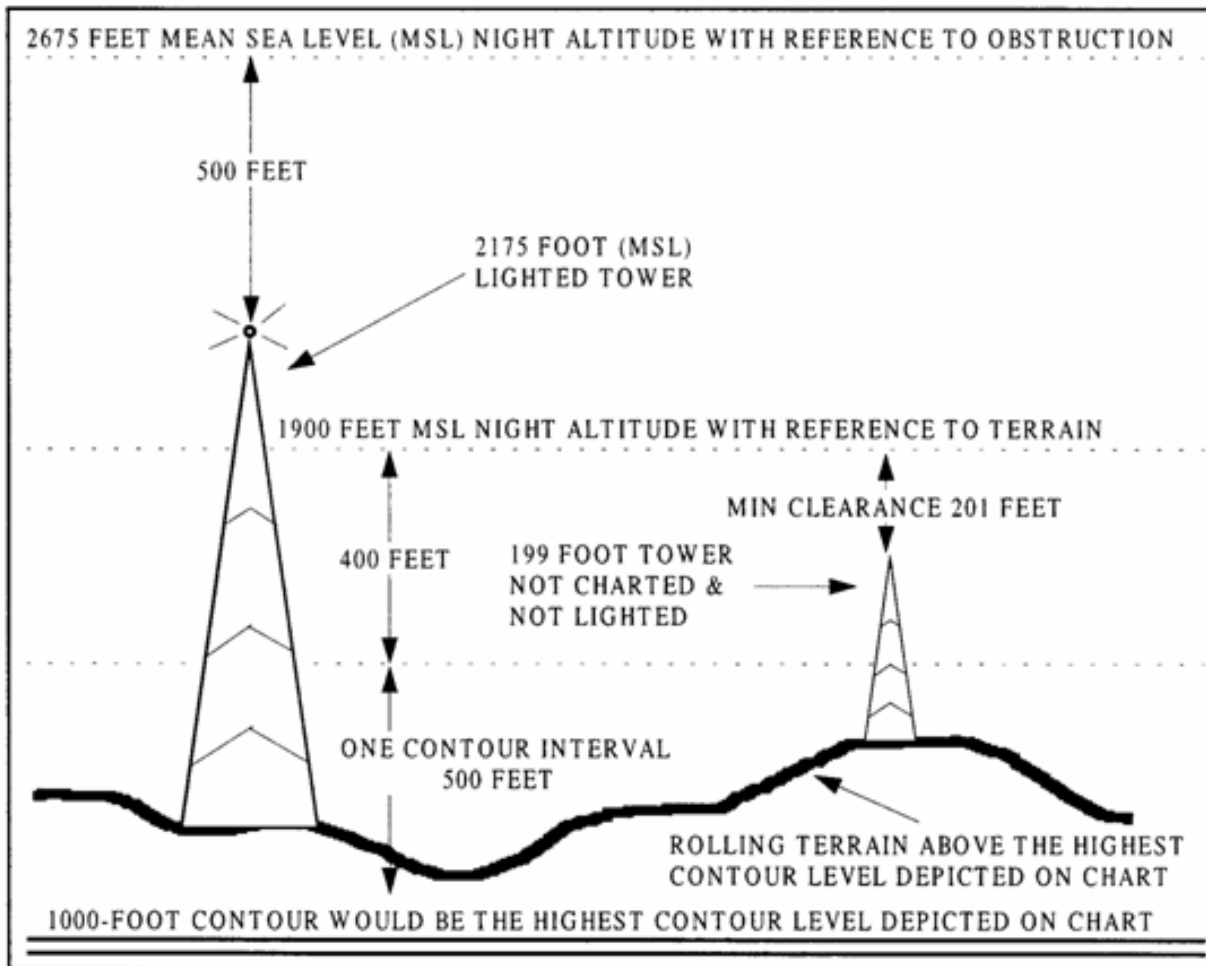


16.4.1. Day VMC En route. Plan a minimum of 500 feet above the highest obstacle within 3 NM or 400 ft plus one chart contour interval. If the altitude for the next leg is higher than the current leg altitude, climbs will be completed before the turnpoint. If the altitude for the next leg is lower, do not initiate descent until after the turnpoint. Legs may be segmented to allow flight closer to the ground. Once the obstruction is visually identified and the aircraft is confirmed well clear, the crew may descend to the next segmented altitude, if lower. See [Figure 16.2](#).

16.4.2. Night VMC En route. Night routes flown on may plan en route legs at an indicated altitude of 500 feet above the highest obstruction to flight (man-made obstacle, terrain feature, or spot elevation), or 400 feet plus one chart contour interval above the highest depicted terrain contour, whichever is highest, within 5 NMs (3 NMs for Airland NVG crews) of route centerline to include the aircraft turn radius over each turnpoint. If the altitude for the next leg is higher than the current leg altitude, climbs will be completed before the turnpoint. If the altitude for the next leg is lower, do not initiate descent until after the turnpoint. Legs may be segmented to allow flight closer to the ground. Once the obstruction is visually identified and the aircraft is confirmed well clear, the crew may descend to the next segmented altitude, if lower. See [Figure 16.2](#).

NOTE: Planning a route on a JOG chart, if available, may reduce night en route altitudes. If the route has been planned on a JOG and night altitudes are verified, the route may be flown with the lower altitudes when flying with reference to a TPC.

Figure 16.2. Night VMC En route Altitude.



16.4.3. NVG En route. Plan en route legs at an indicated altitude of 500 feet above the highest spot terrain elevation, or 400 feet plus one chart contour interval above the highest depicted terrain contour, whichever is higher, within 3 NM on centerline. Three miles prior to the charted man made obstacle, within 3 NM of centerline, the aircrew must visually identify the obstacle. If the obstacle is not identified by 3 NM, climb to attain an altitude 500' above the obstacle. If the altitude for the next leg is higher than the current leg altitude, complete the climb prior to the turn point. If the altitude for the next leg is lower than the current leg, do not initiate descent until over the turn point. Legs may be divided into segments for night altitude computations, depending on terrain differential or threats in order to allow flight closer to the terrain. Once the controlling obstacle or terrain feature is visually identified and the aircraft is confirmed well clear, the crew may descend to the next segmented altitude.

NOTE: Planning a route on a JOG chart, if available, may reduce night en route altitudes. If the route has been planned on a JOG and night altitudes are verified, the route may be flown with the lower altitudes when flying with reference to a TPC.

16.4.4. Minimum Safe Altitude (MSA). MSA is an initial VFR altitude that provides additional terrain clearance while the aircrew analyzes situations that require interruption of low-level operations (route orientation and aircraft malfunctions or when either pilot will leave the seat during low-level operations, etc). An MSA will be computed for each leg or route segment or entire low level route. The MSA is 1000 feet above the highest obstruction within 5 NMs of route centerline.

16.4.5. Minimum IFR En Route Altitude. Compute Minimum IFR En Route Altitude by adding 1000 feet (2,000 feet in mountainous terrain) above the highest obstruction to flight (man-made obstacle, terrain feature, or spot elevation) within 5 NMs of route centerline. This altitude should be rounded off to the next higher 100-foot increment. If the altitude for the next leg is higher than the current leg altitude, climbs will be completed before the turn point. If the altitude for the next leg is lower, do not initiate descent until after the turn point.

16.4.6. Emergency Safe Altitude (ESA). ESA is designed to provide positive IMC terrain clearance during emergency situations that require leaving the low level structure. Several ESAs may be computed for route segments transiting significant terrain differentials or a single ESA may be computed for the entire low level route. To compute ESA, add 1,000 feet (2,000 feet in mountainous terrain) to the elevation of the highest obstruction to flight within 22 NMs of planned route centerline.

NOTES:

1. Climbing to ESA may put the aircraft in a controlled (i.e., IFR) altitude structure requiring coordination with Air Traffic Control agencies.
2. Pressure altimeters are calibrated to indicate true altitudes under International Standard Atmospheric (ISA) conditions. Any deviation from these standard conditions will result in erroneous readings on the altimeter. This error becomes important when considering obstacle clearances in temperatures lower than standard since the aircraft's altitude is below the figure indicated by the altimeter. Refer to the flight information handbook to determine correction.

16.5. Peacetime Route Restrictions. See AFTTP 3-3.35B, chapter 2.

16.6. Navigation Chart Preparation. Mission planners will construct a master chart for mission briefings and aircrew reference. Planners may construct the chart using computerized mission planning systems if available. Sectional charts depict controlled airspace. Low-level navigation charts will be annotated with any added, deleted, or changed information in the most recent CHUM or supplement. In no case will CHUM coverage be less than 22 NMs either side of the entire planned route of flight. Crews may trim charts to no less than 10 NMs after establishing the ESA. Color copies, if available, of a master chart reduce the probability of missing or misplotted data on aircrew charts.

CAUTION: 1:50,000 and smaller scale maps do not depict aeronautical information, may not show man-made obstacles, and are rarely updated through the CHUM.

16.6.1. Chart Annotation. As described in AFTTP 3-3.35B, chapter 2.

16.7. Aircrew Flimsy. Aircrew flimsies are a standardized collection of essential operational information required by aircrews to complete mission planning, conduct route study, fly the mission, and comply with post-mission ground procedures and debriefing requirements.

16.8. Route Study. Crew route study is mandatory before accomplishing flight in the low level environment. An intensive review of the ingress, objective area, and egress routing by the entire crew leads to superior crew coordination and safe mission execution. Aircraft turns planned into higher terrain, critical obstacles that do not meet three-engine climb performance, terrain analysis, threat locations, terrain masking, and tactics will be discussed. Special emphasis should be placed on the run-in and objective area for the locations of visual and radar features that will assist in proper identification. The importance of route study cannot be overemphasized.

16.9. Tactical Aircrew Coordination. Effective crew coordination is crucial to the success of any flight, especially during tactical operations, and will be discussed prior to executing the mission. A convenient time for the entire aircrew to discuss who is going to do or say what, during each phase of the mission, is during route study and/or the mission briefing. Assigning specific in-flight duties, such as who is going to fly specific portions of the arrival and who will make required/desired calls, will reduce confusion at the wrong time. While there is no clear cut definition of crew coordination, the concept deals with the ability of the aircrew to handle a rapidly changing environment and successfully perform the task at hand. This requires maintaining a high level of situational awareness through the crossflow of information between various crew positions. Information should be relative, accurate, complete, timely, and concise, particularly for the objective area and threat reaction maneuvers. Crew coordination discussions should also encompass individual technique, limitations, emergency procedures, and previous lessons learned.

16.10. Briefings.

16.10.1. Mission Planning Pre-Brief. The purpose of the mission planning pre-brief is to familiarize all crewmembers with the general aspects of the mission. The group or squadron commander, combat support group staff specialists, all crewmembers of each participating crew, and other personnel concerned with the mission should attend. During the briefing, indicate what preparation has been accomplished and what is yet to be accomplished. Reference AFTTP 3-3.35B for inclusive items.

16.11. Mission Debriefings. Hold immediately after the mission if practical. Reference AFTTP 3-3.35B for suggested items to include in the debrief.

16.12. NVG Mission Planning.

16.12.1. Long-Term Waivers. The following waivers permit C-5 Airland NVG crews to perform operational missions or training.

16.12.1.1. AFI 11-202V3, paragraph 5.9.5 is waived. Approval to permit night operations to runways not outlined by lights. This waiver applies to NVG approaches only, in accordance with established procedures. Authority is HQ AFFSA/XOF.

16.12.1.2. AFI 11-202V3, paragraph 5.9.6 is waived. A gear down report is not required when approaches are made to nonstandard airfields during upgrade and continuation training, exercises, or contingency operations. In lieu of this call, the pilot who would normally make the gear down

call over the radio will make the same call over the interphone. The safety observer will acknowledge this call after confirming the gear is down. Authority is HQ AFFSA/XOF.

16.12.2. Planning considerations.

16.12.2.1. A qualified Tactics/Planning cell will provide, as a minimum, chummed terminal area charts for the objective airfield out to 22 miles and will sector minimum altitudes, arrival corridors, and significant terrain and obstacles in addition to regular tactics package. If the Tactics/Planning cells is unable to provide these products, pilots should devote a minimum of one day for mission analysis and objective area study prior to flight. Pilots shall develop a visual approach procedure to the landing runway. Additional planning days are not required for successive flights over the same objective area provided the pilots remain the same. Multiple sorties may be planned and flown without additional planning days provided no changes are made to objective area.

16.12.2.2. Two cases exist to determine the type of approach flown into an airfield using NVG Airland procedures. Regardless of the procedure planned and flown, it must allow the aircraft to stabilize and align to the final approach course no later than 2 NMs from touchdown. Stabilized and Aligned, for the purposes of instrument approaches on NVGs, are defined as configured and stabilized on the published instrument straight-in course and capable of safely transitioning to a NVG landing. It is not necessary in the case of a published straight-in instrument approach to be aligned with runway centerline by the 2 NM from touchdown point. A normal transition should be made from the published VDP to align with the runway centerline. Circling and tactical approaches should plan to roll out NLT 2 NM on the landing runway centerline course.

16.12.2.2.1. Case A. A DOD, Jeppesen, or other approved approach exists at the airfield. If the NAVAID is reliable, the approach may be flown. To eliminate the possibilities of mission cancellation due to the subsequent loss of NAVAIDs, and as a means of providing a backup, a backup approach should be constructed. Use procedures described in this AFI or a GPS Overlay approach may be constructed by a qualified source.

16.12.2.2.2. Case B. No approved instrument approach exists for the airfield. The approach, to include a go-around procedure, shall be constructed using techniques in AFTTP 3-3.35B. This may include requesting a GPS instrument approach procedure.

16.12.2.3. Aircraft performance limitations, surrounding terrain and obstacles, threat considerations, and the LZ criteria contained in AFI 13-217 should be considered when determining the feasibility of the selected LZ.

16.12.2.4. The approach is divided into three segments: the Transition and Final approach Segments (which extend from the IAF to the airfield), and the Go-Around segment. These portions of the flight shall be depicted on either a chummed TPC or JOG chart. A Sectional chart may be used to de-conflict the approach segment and for en route map reading by the pilots. The pilot shall direct map reading with a chummed TPC, Sectional, or JOG. Use of FalconView printed charts with ECHUM is highly encouraged.

16.12.2.5. To assist in alignment and runway acquisition select an approach corridor that maximizes geographic points on the run-in that can be readily identified using NVGs based on moon illumination data and topography. This corridor should be selected to minimize exposure to the briefed threat and maximize terrain and obstacle deconfliction.

16.12.2.6. A visual approach to a LZ may include, but is not limited to a random steep approach. See AFTTP 3-3.35 for a more detailed description.

16.12.2.7. During construction of the visual approach special emphasis should be placed on terrain and obstacle deconfliction for both the approach segments as well as the go-around segment.

16.12.2.8. Mission Briefings. The aircraft commander will ensure aircrew members receive a pre-mission briefing using the MAJCOM-approved NVG briefing guide.

Chapter 17

EMPLOYMENT

17.1. General.

17.1.1. Each unit will have a tactics ground training program developed by tactic's and intelligence's staffs tailored to the unit's wartime taskings.

17.1.2. Crews will follow guidance in AFTTP 3-3.35B when performing tactical arrivals and departures, or when operating into locations with a hostile threat environment, except as noted in this chapter.

17.2. Tactical Airland Checklists. Combat Entry and Combat Exit checklists will be executed at the appropriate time prior to entering and upon departing the threat or low altitude environment.

17.3. Energy Management. Performance data will be carefully considered and energy management is essential when planning low altitude operations. This is particularly necessary in mountainous terrain, at heavy gross weights, at high pressure altitudes, and/or with less than full engine power capability. Aggressive maneuvering, even at relatively high airspeeds, can place the aircraft into an approach-to-stall condition or require a go-around. Abrupt control inputs and/or uncoordinated flight should be avoided. These inputs are particularly hard on the airframe; and, in some instances, may increase airframe structural loading beyond design limits, possibly resulting in structural failure. Knowledge of factors that can lead to Pilot Induced Oscillations (PIO) during the landing phase is critical. It does no good to avoid the threat successfully only to exceed aircraft and/or pilot capabilities during the approach and landing phase.

WARNING: Uncoordinated flight reduces stall margins and can cause an abrupt departure from controlled flight. Uncoordinated flight increases airframe structural loading and should be avoided unless an actual threat exists.

17.4. Tactical Arrival.

17.4.1. Rapid descents may be accomplished in accordance with TO 1C-5A-1.

17.4.2. Threats permitting, use all available aids (e.g., map reading, INS/GPS, TACAN) to remain position oriented.

17.4.3. The pilots and other crewmembers as designated by the PIC share responsibility for en route navigation, terrain avoidance, and time control. During low altitude operations, a composite cross-check is paramount for the pilots to ensure threat avoidance and navigation are not done at the expense of basic aircraft control. The FMS should be in TERMINAL mode during low altitude navigation until final approach. Once aligned on final the mode should be switched to APPROACH to provide optimal course deviation information. The attention of the other crewmembers (observers) should be focused outside the aircraft, emphasizing threat detection and situational awareness. Limit duties which distract attention from outside the aircraft to mission essential items only.

17.4.4. Maintain flight planned altitude using the best available altimeter setting, radar altimeter information, or terrain.

17.4.5. Any given approach offers advantages and disadvantages. The approach should avoid all threat envelopes. If this is not possible, reduce aircraft exposure time as much as possible using the

proper altitude, airspeed, and flight path. The entry, slowdown, and approach must ensure a successful landing on the first attempt, but leave adequate margins for the unexpected.

17.4.6. Planning cannot be overemphasized. Analyze environmental factors such as altitude winds, visibility, and weather phenomena and take full advantage of terrain. Also consider decision points, emergency escape plans, and alternate approaches. Decision points are times, positions, or events which should commit you to a specific course of action. Having emergency escape plans and alternate courses of action available will enhance survival.

17.4.7. Plan approaches to the ALZ IAW AFTTP 3-3.35B Chapter 7 and the airfield identification procedures published in the OPORD or SPINS. Where multiple options are available, select the approach which best minimizes exposure to the threat while still allowing a high probability of landing on the first approach. Remain unpredictable. Plan to intercept the glidepath no later than three-quarters of a mile prior to the touchdown zone. For tactical approaches limit bank angles to 30 degrees below 1,000-feet AGL at night and 400-feet AGL during day.

EXCEPTION: Level flight turns during night tactical approaches may use bank angles up to 45 degrees no lower than 500 ft AGL. 1000 ft AGL night restriction still applies to final turn.

17.4.8. Low Altitude Approaches. Use these approaches primarily when a low altitude ingress is necessary, e.g., radar SAMs en route to the field. All maneuvering is done at low altitudes. Enter these approaches from any direction at en route altitude and airspeed.

17.4.9. High Altitude Approaches. Use these approaches when a high or medium altitude ingress is necessary, e.g., small arms environment, and allow some reconnaissance of the field as you fly over. Base initial altitude, airspeed, and heading on the threat.

17.5. Ground Operations. This section outlines procedures to follow when conducting engines running on/off loads (ERO). Crews should spend minimum time on the ground when accomplishing EROs. Preparation and a thorough briefing enhance your ability to operate quickly and safely. Brief appropriate ground personnel and subsequent aircrews on unexpected hazards encountered during takeoff or landing, e.g., dust, winds, hostile activity. Conduct EROs according to [Chapter 5](#). Conduct emergency airlift of personnel according to [Chapter 13](#).

17.6. Emergency Airlift of Personnel. Conduct emergency airlift of personnel according to [Chapter 13](#). For airlift of patients, see Chapter 20.

17.7. Tactical Departures.

17.7.1. Low Escape. See AFTTP 3-3.35B Chapter 7. Use this departure when a low altitude escape is necessary, e.g., radar SAM threat. Remain as low as required while accelerating to en route airspeed. Low escapes should not normally be planned to exceed the recommended maximum airspeed of 350 KCAS. NOTE: When specific threats dictate, speeds up to the maximum operating limits may be used. Retract flaps when clear of all obstacles and at or above V_{MFR} , even if below flap retract altitude, but no lower than 400' AGL. Climb to en route altitude when able as determined by the threat.

17.7.2. High Escape. See AFTTP 3-3.35B Chapter 7. Use this departure when a high or medium altitude escape is necessary, e.g., small arms environment. Accelerate to the best climb speed for the conditions and spiral up to altitude remaining within the confines of the desired maneuver area.

17.8. DELETED

17.9. DELETED

Table 17.1. DELETED

17.10. DELETED

Table 17.2. DELETED

17.11. NVG Airland. NVG airland operations include NVG takeoffs, approaches, landings, and ground operations on infrared-lighted, covert and normally lit airfields. Donning and doffing of NVGs will be initiated by the aircraft commander through the use of the Combat Entry/Exit Checklist or as briefed. This will be conducted during the high level en route portion of the flight. For non-NVG landings, cease NVG usage 5 minutes prior to landing to regain adequate night visual acuity. Generally, NVGs will be doffed during the Combat Exit Checklist.

17.11.1. Aircrew Requirements. Operations into IR-lit airfields are authorized for NVG airland certified aircrews. Normal takeoff and landing emergency procedures will be thoroughly briefed as well as actions taken in the event of NVG failure.

17.11.2. Takeoff and Landing Restrictions. Pilots that have received training in wear of NVGs but not NVG airland qualified may use NVGs for airfield acquisition, but not landing. A non-NVG airland qualified pilot flying the approach and landing will remove NVGs no later than 5 minutes prior to landing. A non-NVG airland qualified PM will remove NVGs as soon as the airfield is acquired but no later than 10 NM. A scanner or safety observer may continue to use NVGs through block-in for situational awareness and safety of flight.

17.11.3. General Approach Procedures. Both pilots and the jumpseat/Safety Observer will wear NVGs during approaches and landings when covert AMP 2 or AMP 3 runway lighting is used. IR-filtered landing lights must be used for landings with covert AMP 2 or AMP 3 runway lighting scheme. Set the radar altimeters to the MAP's AGL altitude from the planned approach plate, from applicable instrument approach procedure, or 300 feet if using VFR approach mode of FMS, during the approach checklist.

NOTES:

1. Use of an approved instrument approach as an IFR letdown to the visual portion of the approach and landing is permitted. To simplify and aide in the transition to the visual portion of the approach and landing, use of NVGs is permitted during instrument approaches, provided the flight deck and instrument lighting is modified to support NVG operations.
2. The primary method for accomplishing NVG landings is via visual approaches. Preflight route study and in-flight chart reading are the keys for successful NVG visual approaches.

17.11.3.1. The jumpseat/safety observer position monitors pilot and copilot instruments, aids in and confirms airfield acquisition, positions switches, and aids the pilots in accomplishing check-lists. He/she will scan bogie position indicators to assure landing gear are forward rolling and confirm landing configuration.

17.11.3.2. If an altimeter setting is unavailable, compare radar and pressure altimeters to a known elevation to determine an updated altimeter setting. Update altimeters as close as possible to the objective area. Typically this will be conducted prior to the IAF. If an update is impossible, use lowest forecast altimeter setting.

WARNING: Do not initiate a descent until the aircraft position is positively identified and adequate terrain clearance is assured. It is essential for the aircrew to verify INS accuracy before beginning the approach to ensure the best possible course guidance into the airfield.

17.11.3.3. During the approach phase, the jumpseat position monitors aircraft altitude, terrain clearance, and provides drift calls, as needed, on final. Announce distance to go from the leading edge of the runway, in one mile increments, commencing at the FAF. At the aircraft commander's request, distance to go calls may be terminated at the MAP. Additional calls (drift, half-mile calls) may be made at the aircraft commander's request.

17.11.3.4. During the landing phase the jumpseat position monitors the radar altimeter and makes calls from 500 feet to 100 feet (e.g. "radar 500") and then calls 50 feet, 20 feet, and 10 feet. The jumpseat position will turn on the IR landing lights at the pre-briefed time (typically at 2 NM but NLT 400 AGL). If requested by the aircraft commander, during full stop landings the jumpseat position calls the ground speed in 20 knot increments beginning at 80 knots.

17.11.3.5. During departure and missed approaches, the PM will periodically announce deviations in airspeed and actual rate of climb.

17.11.4. Go-Around and Missed Approach Procedures. Minimum light landings to austere airfields require the utmost in crew coordination and flying skills. Do not descend below MDA until the touchdown zone is in sight. Execute a go-around or missed approach if:

17.11.4.1. The aircraft is not stabilized on the approach speed, glideslope, or aligned with the runway at one (1) NM from touchdown.

17.11.4.2. The pilot landing the aircraft does not have the touchdown zone or box in sight at the MAP.

17.11.4.3. When advised by any flight deck crewmember or the controlling agency.

17.11.4.4. When either the pilot or copilot experience an NVG failure once past MAP.

17.11.4.5. The coordinated or briefed runway lighting configuration is absent (no communications only).

17.11.4.6. LZ not confirmed by one NM.

17.11.5. Ground Operations. Scanners/Loadmasters performing scanner duties will use NVGs during taxiing and ground operations.

Chapter 18

AEROMEDICAL EVACUATION (AE)

18.1. Mission.

18.1.1. This chapter applies to Air Force C-5 Aircrews, AE aircrews and all management levels concerned with operational of the C-5 aircraft. All operators involved in AE missions on C-5 aircraft will use this AFI.

18.1.2. C-5 aircraft may be used for AE transport of ill or injured DoD members and their dependents. These AE missions may be directed at any time by C2 agencies. AE personnel will utilize the procedures in applicable AFI/H 11-XXX and 41-XXX series, in conjunction with this publication, to accomplish the AE mission.

18.2. Operational Control and Reporting of AE Forces.

18.2.1. HQ AMC is lead command for AE. HQ AMC Directorate of Operations (AMC/DO) is the executive agent for operational AE missions.

18.2.2. Command and control of AE missions is the same as other airlift missions.

18.2.3. Pilot In Command (PIC) is a qualified pilot responsible for command and control of all persons aboard the aircraft during an AE mission. In matters of flight safety, crew duty waivers, or operational considerations, his/her decisions are final (see [Chapter 2](#) for a more detailed list of PIC responsibilities) in matters of patient care, decisions of the MCD are final.

18.2.4. Medical Crew Director (MCD) is a qualified flight nurse responsible for the overall supervision of patient care and management of AECMs assigned to AE missions. He/she advises the PIC on patients' conditions and the use of medical equipment that may affect aircraft operations. The MCD is directly responsible for the safety and medical well being of patients on the aircraft and coordinates enplaning and deplaning procedures with the AEEO and supporting agencies. In matters of patient care, the decisions of the MCD are final.

18.2.5. HQ AMC Command Surgeon (AMC/SG) is responsible for providing clinical standards and procedures concerning the treatment of patients in-flight.

18.2.6. The Aeromedical Evacuation Operations Officer (AEEO), if available, is a Medical Services Corps officer or a Medical Administration Specialist/Technician who acts as a liaison between the AE crew and ground support facilities. When available, the AEEO is responsible for coordinating the launch and recovery of the AE mission.

18.3. Alerting Procedures.

18.3.1. At all locations AMC C2 agency will alert the PIC who will alert the MCD. The MCD will alert the medical crew. The goal is to link the PIC, local AMC C2 agency and MCD before mission execution.

18.3.2. When the AE crew is staged separate from the front-end crew, the MCD will contact AMC local C2 agency and establish alert, showtime, etc. with the C2 agency. The MCD will make every effort to communicate with the front-end crew any mission irregularities prior to crew rest. Utilize

local AMC C2 agency to leave messages for non-emergency. Crew rest will be based on scheduled launch time. Do not violate crew rest.

18.3.3. The local AMC C2 agency will provide AC/MCD AE mission information when he/she checks on mission status. Local C2 agency will be the link between the AE crews and the PIC, thus permitting mission status updates to both parties without interruption of crew rest.

18.3.4. AE mission requirements can change depending on clinical status of patient(s) and aircraft availability. There will be occasions when aircraft cannot depart (i.e. MX problems) or emergency patient movement that may separate an AE crew from the front-end crew. The MCD is responsible for communicating these changes with the PIC and local AMC C2 agency to de-conflict problems.

18.4. PIC Responsibilities.

18.4.1. Establish communication link (CRM) with the MCD during pre-mission planning and throughout the mission.

18.4.2. Brief AE crew on the mission, flight plan, flight profile, and current threat (as applicable).

18.4.3. The PIC will fully integrate front-end and AECMs into single crew throughout the mission including en route transportation, dining, billeting, etc.

18.4.4. Coordinate with MCD and C2 agencies for cabin altitude/flight restrictions based on patient requirements. When the mission/leg is flight managed coordinate flight restrictions with the FM.

18.4.5. For missions with combined cargo and patients coordinate with the MCD for loading, positioning, egress considerations

18.4.6. Comply with hazardous cargo/passenger restrictions in AFI 24-101, *Passenger Movement*.

18.4.7. Advise AECMs of intentions to start engines, taxi, itinerary changes, in-flight difficulties, and additional responsibilities of the flight crew.

18.4.8. Transmit load messages and radio transmissions to tasking AE C2 agency as requested by the MCD.

18.4.9. Brief the MCD on additional responsibilities of the flight crew.

18.5. Loadmaster Responsibilities.

18.5.1. Assist the AE crew with aircraft systems.

18.5.2. Coordinate emergency evacuation plan with the MCD.

18.5.3. Operate aircraft systems, i.e., doors, ramps, emergency exits, etc.

18.5.4. Assist the AE crew as necessary, providing such assistance does not interfere with primary duties.

18.5.5. Assist with aircraft configuration for AE operations.

18.6. AE Crew Responsibilities.

18.6.1. Responsible for patient clinical care activities including loading, positioning, and off-loading.

18.6.2. Assist Loadmaster/maintenance crew with aircraft configuration for AE operations.

18.6.3. Install and remove medical equipment/supplies.

18.6.4. Assist the Loadmaster with observation and care of passengers when it does not interfere with primary duties.

18.6.5. The MCD or designated AECM should be on aircraft inter-phone (headset) for all phases of flight, and will be on aircraft inter-phone during critical phases of flight.

18.7. Ground Operations.

18.7.1. Engines should be shut down during enplaning and deplaning of patients.

18.7.2. Vehicle supervision, movement, and placement in and around the aircraft are the responsibility of the PIC or LM (as applicable).

18.8. Refueling Operations.

18.8.1. Refueling normally begins after deplaning patients are off the aircraft and prior to enplaning that station's patients. The PIC and Chief Servicing Supervisor (CSS) shall ensure aircrew members and servicing personnel accomplish Concurrent Servicing (CS) per AFI 32-2001, *The Fire Protection Operations and Fire Prevention Program*, and TO 00-25-172.

18.8.2. CS may be accomplished with patients onboard provided:

18.8.3. The CSS coordinates with all personnel involved prior to beginning concurrent operations.

18.8.4. Prior to starting concurrent servicing, the total number of patients, passengers, and crew on board the aircraft will be given to the fire department.

18.8.5. Loading ramps/stairs are in place for immediate use and exits (excluding the overhead escape hatches) are opened for egress.

18.8.6. At least two AECMs (one must be a FN) remain onboard to observe patients and assist patients in the event of an egress.

18.8.7. If cabin lights, electrical power to operate medical equipment and aircraft inter-phone are operating prior to refueling, use may be continued during servicing operations. Only those systems, switches or electrical circuits needed to operate equipment to sustain life, may be turned on and used during refueling.

18.8.8. Patients and passengers will not enter or exit the aircraft during servicing. Crewmembers may enter or exit the aircraft only when performing essential duties associated with the concurrent servicing operation.

18.8.9. Activities around the aircraft will be kept to a minimum during the refueling process. Onload/offload patient and passenger baggage prior to or after refueling.

18.8.10. Do not use the on board toilet facilities during servicing.

18.8.11. When the aircrew is at the aircraft, the AC is responsible for all aspects of aircraft operations and shall inform the CSS how aircrew members will participate in passenger evacuation/safety.

18.9. Aircraft Configuration.

18.9.1. On opportune AE missions, configure the aircraft during pre-flight.

18.9.2. Litter Support Provisions. None on this aircraft. Three (3) passenger seats may be broken over so a litter can be secured to their backs using standard cargo straps. Coordinate with loadmaster prior to securing litters.

18.9.3. Available litter spaces and ambulatory seating will depend on the aircraft cabin's mission configuration.

18.9.4. Electrical Power. Secure AE-approved electrical frequency converters to the cargo compartment floor. Distribute power via the Electrical Cable Assembly Set (ECAS) to either the courier or troop compartments (as applicable).

18.9.4.1. Courier compartment - secure frequency converter near fuselage station 1320 (if accessible) and route the ECAS cord(s) through the floor escape hatch.

18.9.4.2. Troop compartment - secure the frequency converter near fuselage station 1820 (if accessible) and route the ECAS cord(s) up the side of the troop ladder.

18.9.5. Therapeutic Oxygen. Therapeutic oxygen is not an integral system on the C-5 aircraft. Use the PTLOX system.

NOTE: The PTLOX system requires up to 300-feet of additional oxygen connecting hose (DISS receptacle to DISS plug) per patient, a DISS plug-to-plug adapter, and a pressure compensated flow meter configured with a DISS receptacle.

18.9.5.1. PTLOX system for the courier compartment: secure the PTLOX system in the cargo compartment and distribute oxygen via oxygen connecting hoses from the PTLOX system through the floor escape hatch.

18.9.5.2. PTLOX system for the troop compartment: secure the PTLOX system in the cargo compartment and distribute oxygen via oxygen connecting hoses from the PTLOX system up the side of the troop ladder.

18.9.6. Integral patient/passenger emergency oxygen is not available on the aircraft. In the event of an emergency, patients and passengers will use the Passenger Oxygen Kit (POK) or Emergency Passenger Oxygen System (EPOS).

18.9.7. AECMs will have an oxygen source available. AECMs normally use an MA-1 portable oxygen bottle, or equivalent. EPOS or EEBDs can be used as an alternate oxygen source if the preplanned flight level is below FL 350. **NOTE:** If a pressure demand regulator is used, the oxygen supply will be turned off when the personal oxygen equipment is removed.

18.9.8. Do not secure aircraft or medical equipment adjacent to an emergency exit in a manner that will prevent or impede egress.

18.9.9. Life Preservers. Use the Adult/Child life preserver for patients.

18.10. Passengers and Cargo.

18.10.1. The PIC, with the concurrence of the MCD, will ensure maximum aircraft utilization for passengers and cargo. Passenger restrictions based upon patient considerations will be identified when seats are released. The AC will advise the appropriate C2 agency of the number seats available for passengers.

18.10.2. Cargo and passengers may be carried with patients unless a clear detriment to the health and well being of the patient or passengers can be demonstrated. The decision will be made by the MCD, considering the need for maximum utilization of the aircraft. Conflicts will be referred to the respective tasking AE command element for a decision. Litters will be positioned forward of cargo pallets. Exception: If cargo is in place, and the aircraft commander and MCD agree, patients may be transported aft of the cargo. The MCD and Loadmaster will ensure patient egress is not affected by mixed cargo/patient loads.

18.10.3. Cargo will not be bumped except in unusual/abnormal cases, and only after the MCD has coordinated with the AC and notified the tasking AE command element.

18.10.4. Do not move ambulatory patients to litters in order to provide seating for additional patients or passengers.

18.10.5. For patient comfort and to permit inflight rest for patients use the following for missions over 4 hours in duration:

18.10.5.1. Minimum of 2 litters must be available for ambulatory patients.

18.10.5.2. One seat must be reserved for every 3 litter patients.

18.10.6. An emergency litter will be set up on all AE missions.

18.10.7. Patient Therapeutic Liquid Oxygen (PTLOX) may be transported for positioning and deposition of Operational/contingency support AE Missions.

18.10.8. A maximum of 25 PT LOX serviced units may be transported simultaneously without Hazmat certification. Processing through aerial port is not required. If shipping more than six PTLOX containers as cargo, do not cover the containers with plastic. This will prevent potential accumulation of high oxygen concentration levels. **WARNING:** Ensure the cargo floor is free from any oil or petroleum products.

18.10.9. Hazardous cargo will not normally be transported aboard AE missions.

18.10.10. AE Movement of Contaminated/Contagious Personnel. Potentially contaminated patients must be decontaminated before entering the AE system. However, in extreme circumstances, the AMC/CC is the policy waiver authority for movement of contaminated/contagious casualties/personnel. If a waiver is approved, AMC will provide the capability to move a small number of contaminated/contagious casualties (a combination of approximately 50, with a maximum of 20 contagious personnel). AMC will equip AE crew operating in designated high-threat areas with the required equipment/supplies to carry out this mission.

NOTE: If AECMs are utilizing the MCU-2A ground chemical mask, a FL below 10,000 feet is recommended due to reported valve failure during rapid decompression.

18.11. Crash/Fire/Rescue.

18.11.1. Aircraft carrying patient(s) will be provided CFR protection per T.O. 00-25-172. Stand-by CFR vehicle is not necessary during normal operations however, a CFR vehicle will be available upon request. The flight crew will coordinate CFR requirements.

18.11.2. At non-AMC bases, non-U.S. military bases, and civilian airfields, the controlling agency will coordinate the CFR coverage, as necessary. The request for CFR vehicle coverage may be denied. This will not prevent refueling operations from occurring.

18.12. AE Call Sign/Use of Priority Clearance.

18.12.1. AIREVAC Priority. The AC may request AIREVAC priority for preferential ATC handling if a delay will affect a patient's well being. Aircraft commanders will request priority handling if AE missions are experiencing long delays during takeoff or landing phases, which will affect a patient's condition.

18.13. Load Message.

18.13.1. For C-5 AE missions, the MCD will complete an AF Form 3858, **C-130/C-141 Aeromedical Evacuation Mission Offload Message** and coordinate for transmission of patient information to C2 with the "2 hour out call."

18.14. ERO Procedures.

18.14.1. ERO procedures are outlined in AFI 11-2AEV3, *Aeromedical Evacuation (AE) Operations Procedures*. ERO procedures for loading patients are authorized for contingency operations or when AE mission requirements dictate minimum ground time. ERO procedures can be practiced/trained during ARMs, joint training operations, exercises, etc. EROs will not be used in a noncontingency environment unless mission essential.

18.14.2. The loadmaster will be positioned on the left side, at the foot of the ramp and on headset during actual onload procedures.

18.14.3. When litter patients are wearing personal gear (i.e. web belts, canteen, helmets, flak vests, etc.) if necessary and situation requires/permits, remove personal gear from patients and secure on ramp or in a designated area.

18.15. Forms Prescribed. AF IMT 4097, **Aircraft Identification**, AF IMT 4098, **TOLD Card Worksheet**, AF IMT 4099, **TOLD CARD (C-5)**, **Forms Adopted.** DD 365-3, **Chart C-Basic Weight and Balance Record**, DD 365-4, **Weight and Balance Clearance Form F-Transport/Tactical**, DD 1351-2, **Travel Voucher or Sub-voucher**, DD 1351-2c, **Travel Voucher or Sub-voucher (Continuation Sheet)**, DD 1610, **Request and Authorization for TDY Travel of DoD Personnel**, DD 1801, **DOD International Flight Plan**, DD 1854, **US Customs Accompanied Baggage Declaration**, DD Form 2131, **Cargo/Passenger Manifest**, DD 2133, **Joint Airlift Inspection Record**, CF 6059B, **US Customs Accompanied Baggage Declaration**, CF 7507, **General Declaration Outward/Inward**, AF IMT 8, **Certificate of Aircrew Qualification**, AF IMT 15, **United States Air Force Invoice**, AF IMT 129, **Tally In-Out**, AF IMT 315, **USAF AV Fuel Invoice**, AF IMT 457, **USAF Hazard Report**, AF IMT 651, **Hazardous Air Traffic Report (HATR)**, AF IMT 664, **Aircraft Fuels Documenting Log**, AF IMT 673, **Request to Issue Publication**, AF IMT 711B, **USAF Mishap Report**, AFTO 781, **ARMS Aircrew/Mission Data Document**, AFTO 781A, **Maintenance Discrepancy and Work Document**, AF IMT 847, **Recommendation for Change of Publication**, AF IMT 1297, **Temporary Issue Receipt**, AF IMT 1631, **NATO Travel Orders**, AF IMT 3211, **Customer Comments**, AF IMT 4069, **Tiedown Equipment Checklist**, AF IMT 4075, **Aircraft Load Data Worksheet**, AF IMT 4128, **Fleet Service Checklist**, AMC 41, **Flight Authorization**, AMC IMT 43, **AMC Transient Aircrew Comments**, AMC IMT 54,

Aircraft Commander's Report on Services/Facilities, AMC IMT 70, RUSH Baggage Manifest, AMC IMT 97, AMC In-Flight Emergency and Unusual Occurrence Worksheet, AMC 148, Boarding Pass/Ticket, AMC IMT 305, Receipt for Transfer of Cash and Vouchers, AF IMT 4052, C-141/C-130/C-5/Refueling Computation, AF IMT 4053, INS Flight Plan and Log AF IMT 4327a, Crew Flight Authorization, SF 44, Purchase Order-Invoice-Voucher.

CARROL H. CHANDLER, Lt General, USAF
DCS/Air & Space Operations

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION****References**

AFPD 10-9, *Lead Operating Command Weapon Systems Management*, 8 Mar 2007

AFPD 10-21, *Air Mobility Lead Command Roles and Responsibilities*, 1 May 1998

AFMAN 10-206, *Operational Reporting*, 4 Oct 2004

AFMAN 91-223, *Aviation Safety Investigations and Reports*, 6 Jul 2004

AFI 10-245, *Air Force Antiterrorism*, 21 Jun 2002

AFI 10-403, *Deployment Planning and Execution*, 13 Jan 2008

AFI 10-707, *Spectrum Interference Resolution Program*, 20 Jun 2005

AFI 10-801, *Assistance to Civilian Law Enforcement Agencies*, 15 Apr 1994

AFPD 11-2, *Aircraft rules and Procedures*, 14 Jan 2005

AFI 11-202V1, *Aircrew Training*, 17 May 2007

AFI 11-202V2, *Aircrew Standardization/Evaluation Program*, 6 Dec 2006

AFI 11-202V3, *General Flight Rules*, 5 Apr 2006

AFJI 11-204, *Operational Procedures for Aircraft Carrying Hazardous Materials*, 11 Nov 1994

AFI 11-209, *Air Force Aerial Events*, 4 May 2006

AFI 11-215, *Fight Manual Program*, 6 Apr 2005

AFI 11-217V1, *Instrument Flight Procedures*, 3 Jan 2005

AFI 11-218, *Aircraft Operations and Movement on the Ground*, 11 May 2005

AFI 11-299, *Nuclear Airlift Operations (FOUO)*, 19 Mar 2008

AFI 11-301V1, *Aircrew Life Support (ALS) Program*, 19 Jul 2002

AFI 11-401, *Aviation Management*, 13 Aug 2007

AFI 11-2AEV3, *Aeromedical Evacuation (AE) Operations Procedures*, 18 May 2005

AFI 11-2C-5V1, *C-5 Aircrew Training*, 10 Aug 2007

AFI 11-2C-5V2, *C-5 Aircrew Evaluation Criteria*, 25 Oct 2005

AFI 13-207, *Preventing and Resisting Aircraft Piracy (Hijacking) FOUO*, 1 April 1994

AFI 13-212, *Space, Missile, Command and Control*, 16 Nov 2007

AFI 13-217, *Assault Zone Procedures*, 10 May 2007

AFI 21-101, *Aerospace Equipment Maintenance Management*, 29 Jun 2006

AFI 31-101, *The Air Force Installation Security Program*, 3 Mar 2003

AFJI 31-102, *Physical Security*, 31 May 1991

AFI 31-207, *Arming and Use of Force by Air Force Personnel*, 1 Sep 1999

AFI 31-401, *Information Security Program Management*, 1 Nov 2005

AFI 32-2001, *The Fire Protection Operations and Fire Prevention Program*, 1 Apr 1999

AFI 33-324, *The Information Collections and Reports Management Program: Controlling Internal, Public, and Interagency Air Force Information Collections*, 1 Jun 2000

AFI 33-360, *Publications and Forms Management Program*, 18 May 2006

AFI 33-363, *Management of Records*, 1 Mar 2008

AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*, 2 Aug 2006

AFJI 48-104, *Quarantine Regulations of the Armed Forces*, 24 Jan 1992

AFI 48-123, *Medical Examinations and Standards*, 5 Jun 2006

AFI 91-202, *The US Air force Mishap Prevention Program*, 1 Aug 1998

AFI 91-204, *Safety Investigations and Reports*, 14 Feb 2006

AFOSHSTD 91-100, *Aircraft Flight Line – Ground Operations and Activities*, 1 May 1998

AFTTP 3-1V1 (S), *General Planning and Employment Considerations*, 1 May 2006

AFTTP 3-1V2 (S), *Threat Reference Guide and Counter Tactics*, 25 Dec 2006

AFTTP 3-1V35 (S), *Tactical Employment – C-5, C-17, C-141*, 2 Nov 2004

DoD 4515.13-R, *Air Transportation Eligibility*, Nov 1994

FLIP (*DoD Flight Information Publication*)

Joint Publication 1-02, *DOD Dictionary of Military and Associated Terms*

T.O. 00-25-172, *Ground Servicing of Aircraft and Static Grounding/Bonding*, 15 Jul 2002

| Abbreviations and Acronyms

ACDE—Aircrew Chemical Defense Ensemble

ACF—Acceptance Check Flight

ACM—Additional Crew Member

AE—Aeromedical Evacuation

AECM—Aeromedical Evacuation Crew Member

AEO—All engines operating

AFCS—Automatic Flight Control System

AFRC—Air Force Reserve Component

AGE—Aircraft Ground Equipment

AGL—Above Ground Level

AMC—Air Mobility Command

AMCC—Air Mobility Control Center

ANG—Air National Guard

AOR—Area of Responsibility

AP—Auto Pilot

APU—Auxiliary Power Unit

AR—Air Refueling

ARCP—Air Refueling Control Point

ARCT—Air Refueling Control Time

ARIP—Air Refueling Initial Point

ASRR—Airfield Suitability and Restrictions Report

AT—Auto Throttle

ATA—Actual Time of Arrival

ATC—Air Traffic Control

ATS—Auto Throttle System

BASH—Bird Aircraft Strike Hazard

BRNAV—Basic Area Navigation Airspace

C2—Command and Control

CAT I—Category I ILS Approach

CAT II—Category II ILS Approach

CCA—Contamination Control Area

CDT—Crew Duty Time

CFL—Critical Field Length

CFP—Computer Flight Plan

CG—Center of Gravity

COMSEC—Communications Security

CRG—Contingency Response Group

CSS—Chief Servicing Supervisor

CVR—Cockpit Voice Recorder

CW—Chemical Warfare

C2IPS—Command and Control Information Processing System

DCS—Defense Courier Service

DH—Decision Height

DTD—Data Transfer Device
EMCON—Emitter Control
EPR—Engine Pressure Ratio
ERO—Engine Running On/Offload
ETA—Estimated Time of Arrival
ETE—Estimated Time En route
ETIC—Estimated Time In Commission
ETP—Equal Time Point
FAF—Final Approach Fix
FCB—Flight Crew Bulletin
FCIF—Flight Crew Information File
FCF—Functional Check Flight
FDP—Flight Duty Period
FIR—Flight Information Region
FLIP—Flight Information Publications
FMC—Full Mission Capable
FMS—Flight Management System
FOD—Foreign Object Damage
FOL—Forward Operating Location
FSO—Flight Safety Officer
G/S—Glide Slope
GDSS—Global Decision Support System
GMT—Greenwich Mean Time
GPS—Global Positioning System
GPWS—Ground Proximity Warning System
HATR—Hazardous Air Traffic Report
HDG—Heading
HF—High Frequency
HQ—Have Quick
IAS—Indicated Airspeed
ICAO—International Civil Aviation Organization
ICS—Infant Car Seat

IFF—Identification Friend or Foe

IFR—Instrument Flight Rules

ILS—Instrument Landing System

IMT—Integrated Management Tool

INOP—Inoperative

INS—Inertial Navigation System

IP—Initial Point

KCAS—Knots Calibrated Airspeed

KIAS—Knots Indicated Airspeed

KTS—Knots

LOC—Localizer

LRC—Long Range Cruise

MACH—Mach Number

MAF—Mobility Air Forces

MAX—Maximum Thrust

MC—Mission Contributing

MCD—Medical Crew Director

MCT—Maximum Continuous Thrust

MDA—Minimum Descent Altitude

MDS—Mission Design Series (e.g., C5)

ME—Mission Essential

MEL—Minimum Equipment List

MNPS—Minimum Navigation Performance Specification

MOB—Main Operating Base

MSL—Mean Sea Level

MWS—Missile Warning System

NEW—Net Explosive Weight

NAF—Numbered Air Force

NM—Nautical Mile

NOTAM—Notice to Airmen

OAT—Outside Air Temperature

OEI—One engine inoperative

OIS—Obstacle Identification Surface
OST—Off-Station Trainer
PF—Pilot Flying
PM—Pilot Monitoring
PMSV—Pilot to Metro Service
PPR—Prior Permission Required
PSN—Proper Shipping Name
RA/BA—Radar Altitude/Barometric Altitude
RAT—Ram Air Turbine
RCR—Runway Condition Reading
RDS—Records Disposition Schedule
RNP—Required Navigation Performance
RRFL—Required Ramp Fuel Load
RSC—Runway Surface Condition
RVSM—Reduced Vertical Separation Minimum
RZ—Rendezvous
SAAM—Special Assignment Airlift Mission
SATCOM—Satellite Communications
SID—Standard Instrument Departure
SIGMETS—Significant Meteorological Information
SPR—Single Point Refueling
TOGA—Takeoff/Go-Around
TOLD—Take off and Landing Data
VNAV—Vertical Navigation
ZFW—Zero Fuel Weight

| Terms

Aeromedical Evacuation (AE)—Movement of patients under medical supervision between medical treatment facilities (MTFs) by air transportation.

Aeromedical Evacuation Coordination Center (AECC)—(DOD) A coordination center, within the joint air operations center's airlift coordination cell, which monitors all activities related to aeromedical evacuation (AE) operations execution. It manages the medical aspects of the AE mission and serves as the net control station for AE communications. It coordinates medical requirements with airlift capability, assigns medical missions to the appropriate AE elements, and monitors patient movement activities. Also called AECC.

Aeromedical Evacuation Crew member (AECM)—Qualified Flight Nurse (FN) and Aeromedical Evacuation Technician performing AE crew duties.

Aeromedical Evacuation Operations Officer (AEEO)—Medical Service Corps (MSC) officer or medical administrative specialist or technician (AFSC 4A0X1) assigned to the AE system to perform duties outlined in applicable Air Force policy directives, instructions, 41-series handbooks, and this AFI.

Aeromedical readiness Mission (ARM)—Training missions using simulated patients to prepare for the wartime/contingency movement of patients.

Air Force Satellite Communication (AFSATCOM)—Satellite communications system capable of 75 bits per second (BPS) record message traffic.

Air Force Component Commander (AFCC)—In a unified, sub-unified, or joint task force command, the Air Force commander charged with the overall conduct of Air Force air operations.

Airlift—Aircraft is considered to be performing airlift when manifested passengers or cargo are carried.

Air Mobility Control Center (AMCC)—Provides global coordination of tanker and airlift for AMC and operationally reports to the 618 TACC. Functions as the AMC agency that manages and directs ground support activities and controls aircraft and aircrews operating AMC strategic missions through overseas locations.

Air Mobility Element (AME)—The air mobility element is an extension of the Air Mobility Command Tanker Airlift Control Center deployed to a theater when requested by the geographic combatant commander. It coordinates strategic airlift operations with the theater airlift management system and collocates with the air operations center whenever possible. Also called AME.

Air Reserve Component (ARC)—Refers to Air National Guard and Air Force Reserve Command forces, both Associate and Unit Equipped.

Allowable Cabin Load (ACL)—The maximum payload which can be carried on an individual sortie. Also called ACL.

Air Route Traffic Control Center (ARTCC)—The principal facility exercising en route control of aircraft operating under instrument flight rules within its area of jurisdiction. Approximately 26 such centers cover the United States and its possessions. Each has a communication capability to adjacent centers.

Air Traffic Control (ATC)—A service provided by an appropriate authority to promote the safe, orderly and expeditious use of the air transportation system and to maximize airspace utility.

AMC History System—Database that compiles and stores tanker activity input by line units.

Augmented Crew—Basic aircrew supplemented by additional qualified aircrew members to permit in-flight rest periods.

Aviation Into-Plane Reimbursement (AIR) Card—A credit card that can be used to purchase aviation fuels, related fuel supplies and ground services at commercial airports where no Dod or Canadian Into-Plane contract exists.

Bird Aircraft Strike Hazard (BASH)—An Air Force program designed to reduce the risk of bird strikes.

Bird Watch Condition Low—Normal bird activity [as a guide, fewer than 5 large birds (waterfowl, raptors, gulls, etc.) or fewer than 15 small birds (terns, swallows, etc)] on and above the airfield with a low probability of hazard. Keep in mind a single bird in a critical location may elevate the Bird Watch Condition (BWC) to moderate or severe.

Bird Watch Condition Moderate—Increased bird population (approximately 5 to 15 large birds or 15 to 30 small birds) in locations that represent an increased potential for strike. Keep in mind a single bird in a critical location may elevate the BWC to moderate or severe.

Bird Watch Condition Severe—High bird population (as a guide, more than 15 large birds or 30 small birds) in locations that represent an increased potential for strike. Keep in mind a single bird in a critical location may cause a severe BWC.

Block Time—Time determined by the scheduling agency responsible for mission accomplishment for the aircraft to arrive at (block in) or depart from (block out) the parking spot.

Blue Bark—US military personnel, US citizen civilian employees of the Department of Defense, and the dependents of both categories who travel in connection with the death of an immediate family member. It also applies to designated escorts for dependents of deceased military members. Furthermore, the term is used to designate the personal property shipment of a deceased member.

Border Clearance—Those clearances and inspections required to comply with federal, state, and local agricultural, customs, immigration, and immunizations requirements.

Category I Route—Any route that does not meet the requirements of a category II route, including tactical navigation and over water routes.

Category II Route—Any route on which the position of the aircraft can be accurately determined by the overhead crossing of a radio aid (NDB, VOR, TACAN) at least once each hour with positive course guidance between such radio aids.

Chalk Number—Number given to a complete load and to the transporting carrier.

Charge Medical Technician (CMT)—AET responsible for ensuring completion of enlisted aeromedical crew duties.

Chart Update Manual—Chart Update Manual (CHUM). Manual issued each March and September (with monthly supplements) to update maps/charts with new information. It may reflect temporary or permanent information pending the next chart/map release.

COIN ASSIST—Nickname used to designate dependent spouses accompanying dependent children and dependent parents of military personnel reported missing or captured who may travel space available on military aircraft for humanitarian purposes on approval of the Chief of Staff, United States Army; Chief of Staff, United States Air Force; Chief of Naval Operations; or the Commandant of the Marine Corps.

Combat Control Team (CCT)—A small task organized team of Air Force parachute and combat diver qualified personnel trained and equipped to rapidly establish and control drop, landing, and extraction zone air traffic in austere or hostile conditions. They survey and establish terminal airheads as well as provide guidance to aircraft for airlift operations. They provide command and control, and conduct reconnaissance, surveillance, and survey assessments of potential objective airfields or assault zones. They also can perform limited weather observations and removal of obstacles or unexploded ordinance with demolitions.

Command and Control (C2)—The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission. Also called C2.

Command and Control Center—Each C2 Agency provides supervision, guidance, and control within its assigned area of responsibility. For the purpose of this AFI, C2 Agencies include operations centers, command posts, air mobility elements, contingency response groups (CRG), air mobility control centers, and tanker task forces.

Command and Control Information Processing System (C2IPS)—Computer-based information transmission and information handling for command and control functions associated with the Director of Mobility Forces (DIRMOBFOR), AME fixed units, and CRGs. Interfaces to and automatically updates the Global Decision Support System (GDSS).

CONFERENCE HOTEL—Communication conference available to help aircrews solve in-flight problems that require additional expertise.

Contingency Mission—Mission operated in direct support of an OPORD, OPLAN, disaster, or emergency.

Contingency Response Group (CRG)—Team of qualified Air Force personnel established to control, coordinate, and function as an Air Force tanker and airlift C2 facility at a base where normal AMC C2 facilities are not established or require augmentation.

Critical Phase of Flight—Takeoff, air refueling (Precontact and closer), low level (below MSA), airdrop, approach, and landing.

DCS Courier—Members of the U.S. Armed Forces or civilian employees assigned to the DCS, who have completed the DCS Training School and are qualified as couriers by the Commander, DCS. DCS couriers are identified by DCS Form 9 credential sets issued by the DCS.

Deadhead Time—Duty time for crew members positioning or de-positioning for a mission or mission support function.

Designated Courier—Officer or enlisted member in the grade of E-5 or above of the US Armed Forces, or a Department of State diplomatic courier, selected by the Defense Courier Service (DCS) to accept, safeguard, and deliver DCS material as directed. A primary aircrew member should be used as a courier only as a last resort and can be designated only with the pilot in command's concurrence.

Desolate Terrain Missions—Any mission in excess of one hour over desert, tropical, or jungle terrain (not to include flights conducted over the CONUS).

Deviation—A deviation occurs when takeoff time is not within -20/+14 minutes of scheduled takeoff time. Scheduled takeoff time may be adjusted to make good an ARCT. Notify controlling agency before takeoff to adjust the scheduled takeoff time.

Direct Instructor Supervision—Supervision by an instructor of like specialty with immediate access to controls (for pilots, the instructor must occupy either the pilot or copilot seat).

Digital Aeronautical Flight Information File (DAFIF)—Digitized FLIP data containing airport, runway, navigation aid, and enroute data. Contains both low and high altitude structures.

Director, Mobility Forces (DIRMOBFOR)—Individual in command of all mobility forces within a designated area or for a designated operation. In overseas theaters, the DIRMOBFOR is normally responsible for theater mobility force management. The Air Force component commander exercises operational control of assigned or attached mobility forces through the DIRMOBFOR. The DIRMOBFOR monitors and manages assigned mobility forces operating in theater.

Distinguished Visitor (DV)—Passengers, including those of friendly nations, of star or flag rank or equivalent status, to include diplomats, cabinet members, members of Congress, and other individuals designated by the DoD due to their mission or position (includes BLUE BARK and COIN ASSIST).

Double Blocking—When an aircraft is required to block-in at one parking spot, then move to normal parking for final block-in. The extra time required for double blocking will be taken into account during mission planning/scheduling. To compensate for double blocking on departure, the aircrew "legal for alert time" may be adjusted to provide additional time from aircrew "show time" to departure. When double blocking is required on arrival, the aircrews entry into crew rest will be delayed until postflight duties are complete.

Due Regard—Operational situations that do not lend themselves to International Civil Aviation Organization (ICAO) flight procedures, such as military contingencies, classified missions, politically sensitive missions, or training activities. Flight under "Due Regard" obligates the military aircraft commander to be his or her own air traffic control (ATC) agency and to separate his or her aircraft from all other air traffic. (See FLIP General Planning, section 7.)

Equal Time Point (ETP)—Point along a route at which an aircraft may either proceed to destination or first suitable airport or return to departure base or last suitable airport in the same amount of time based on all engines operating.

Estimated Time to Block In (ETB)—ETA + 15 minutes.

Estimated Time In Commission (ETIC)—Estimated time required to complete required maintenance.

Execution—Command-level approval for initiation of a mission or portion thereof after due consideration of all pertinent factors. Execution authority is restricted to designated command authority.

Familiar Field—An airport in the local flying area at which unit assigned aircraft routinely perform transition training. Each operations group commander will designate familiar fields within their local flying area.

Firm Scheduled Return Time (FSRT)—Scheduling tool used by air mobility units to predict when crews will return to home station. FSRT for active duty and AFRC is defined as SRT plus 24 hours.

Flight Manager (FM)—Flight Managers accomplish flight planning actions to assist aircrews in safely, effectively and efficiently executing the sortie within AMC force protection policies and parameters. Flight Managers will perform flight watch of airborne sorties and provide a high level of C2 support to aircrews.

Global Decision Support System (GDSS)—AMC's primary execution command and control system. GDSS is used to manage the execution of AMC airlift and tanker missions.

Global Patient Movement Requirements Center (GPMRC)—A joint activity reporting directly to the Commander in Chief, US Transportation Command, the Department of Defense single manager for the regulation of movement of uniformed services patients. The Global Patient Movement Requirements Center authorizes transfers to medical treatment facilities of the Military Departments or the Department

of Veterans Affairs and coordinates intertheater and inside continental United States patient movement requirements with the appropriate transportation component commands of US Transportation Command. See also medical treatment facility.

Ground Time—Interval between engine shut down (or arrival in the blocks if engine shutdown is not scheduled) and next takeoff time.

Hazardous Cargo or Materials—Articles or substances that are capable of posing significant risk to health, safety, or property when transported by air and classified as explosive (class 1), compressed gas (class 2), flammable liquid (class 3), flammable solid (class 4), oxidizer and organic peroxide (class 5), poison and infectious substances (class 6), radioactive material (class 7), corrosive material (class 8), or miscellaneous dangerous goods (class 9). Classes may be subdivided into divisions to further identify hazard, i.e., 1.1, 2.3, 6.1, etc.

Home Station Departure—For the purposes of **Chapter 4** of this instruction, home station departure refers to a flight duty period which begins at the unit's home base and is planned to terminate at another location.

Instructor Supervision—Supervision by an instructor of like specialty. For critical phases of flight, the instructor must occupy one of the seats or stations, with immediate access to the controls.

Interfly—The exchange and/or substitution of aircrews and aircraft between Mobility Air Forces (MAF) including crew members and/or C-5 aircraft from AETC and AMC-gained AFRC forces.

In-Place Time (IPT)—Time when an aircraft and crew are at an operating base and prepared to load for the mission.

Joint Airborne/Air Transportability Training (JA/ATT)—Continuation and proficiency combat airlift training conducted in support of DoD agencies. Includes aircraft load training and service school support. HQ AMC publishes JA/ATT taskings in AMC OPORD 17-76, annex C, appendix 1.

L-Band SATCOM—600 BPS satellite communications (SATCOM) system contracted through the International Maritime Satellite Organization (INMARSAT), used primarily for command and control. The system consists of a satellite transceiver, a laptop computer, and a printer.

Loading Time—Specific time established jointly by the commanders concerned when aircraft loading will begin. For paratroopers, 20 minutes before Air Force stations time.

Local Training Mission—A mission scheduled to originate and terminate at home station (or an off-station training mission), generated for training or evaluation, and executed at the local level

Maintenance Status—

A-1; No maintenance required.

A-2 (Plus Noun); Minor maintenance required, but not serious enough to cause delay. Add nouns that identify the affected units or systems, i.e. hydraulic, ultra high frequency (UHF) radio, radar, engine, fuel control, generator, boom or drogue, etc. Attempt to describe the nature of the system malfunction to the extent that appropriate maintenance personnel will be available to meet the aircraft. When possible, identify system as mission essential (ME) or mission contributing (MC).

A-3 (Plus Noun); Major maintenance. Delay is anticipated. Affected units or systems are to be identified as in A-2 status above.

A-4; Aircraft or system has suspected or known biological, chemical, or radiological contamination.

Medical Crew Director (MCD)—FN responsible for supervising patient care and AEMCs assigned to AE missions. On missions where an FN is not onboard, the senior AET will function as MCD.

Mission—1. The task, together with the purpose, that clearly indicates the action to be taken and the reason therefor. 2. In common usage, especially when applied to lower military units, a duty assigned to an individual or unit; a task. 3. The dispatching of one or more aircraft to accomplish one particular task.

Mission Advisory—Message dispatched by command and control agencies, liaison officers, or aircraft commanders advising all interested agencies of any changes in status affecting the mission.

Mission Clinical Coordinator (MCC)—A qualified MCD or CMT, in addition to the basic crew and instructors and flight examiners. Responsible for coordinating training activities on ARMs.

Mobility Air Force (MAF)—Forces assigned to mobility aircraft or MAJCOMs with operational or tactical control of mobility aircraft.

Modified Contour—Flight in reference to base altitude above the terrain with momentary deviations above and below the base altitude for terrain depressions and obstructions to permit a smooth flight profile.

Off Station Training Flight—A training flight that originates or terminates at other than home station that is specifically generated to provide the aircrew experience in operating away from home station. Off station trainers will not be generated solely to transport passengers or cargo.

Operational Control (OPCON)—Transferable command authority that may be exercised by commanders at any echelon at or below the level of combatant command. Operational control is inherent in combatant command (command authority). Operational control may be delegated and is the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. Operational control includes authoritative direction over all aspects of military operations and joint training necessary to accomplish missions assigned to the command. Operational control should be exercised through the commanders of subordinate organizations. Normally this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. Operational control normally provides full authority to organize commands and forces and to employ those forces as the commander in operational control considers necessary to accomplish assigned missions. Operational control does not, in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training. Also called OPCON.

Operational Missions—Missions executed at or above 618 TACC level.

Operational Risk Management (ORM)—ORM is a logic-based, common sense approach to making calculated decisions on human, materiel, and environmental factors before, during, and after Air Force operations. It enables commanders, functional managers and supervisors to maximize operational capabilities while minimizing risks by applying a simple, systematic process appropriate for all personnel and Air Force functions.

Opportune Airlift—Transportation of personnel, cargo, or both aboard aircraft with no expenditure of additional flying hours to support the airlift.

Originating Station—Base from which an aircraft starts on an assigned mission. May or may not be the home station of the aircraft.

Over water Flight—Any flight that exceeds power off gliding distance from land.

Pathfinder Aircraft—Aircraft that precedes the main force to the objective area. Its primary functions are to airdrop the CCT and provide current weather information to the main force.

Patient—Movement Categories

Urgent—Patients who must be moved immediately to save life, limb, or eyesight, or to prevent complication of a serious illness.

Priority—Patients requiring prompt medical care that must be moved within 24 hours.

Routine—Patients who should be picked up within 72 hours and moved on routine/scheduled flights.

Permit to Proceed—Aircraft not cleared at the first US port of entry may move to another US airport on a permit to proceed issued by customs officials at the first port of entry. This permit lists the requirements to be met at the next point of landing, i.e. number of crew and passengers, cargo not yet cleared. Aircraft commanders are responsible to deliver the permit to proceed to the customs inspector at the base where final clearance is performed. (Heavy monetary fines can be imposed on the aircraft commander for not complying with permit to proceed procedures.)

Point Of No Return—A point along an aircraft track beyond which its endurance will not permit return to its own or some other associated base on its own fuel supply.

Point of Safe Return—Most distant point along the planned route from which an aircraft may safely return to its point of departure or alternate airport with required fuel reserve.

Positioning and De-positioning Missions—Positioning missions are performed to relocate aircraft for the purpose of conducting a mission. De-positioning missions are made to return aircraft from bases at which missions have terminated.

Quick Stop—Set of procedures designed to expedite the movement of selected missions by reducing ground times at en route or turnaround stations.

Ramp Coordinator—Designated representative of the C2 agency whose primary duty is the coordination of ground handling activities on the ramp during large scale operations.

Scheduled Return Time (SRT)—Scheduling tool used by air mobility units to predict when crews will return to home station. It allows force managers to plan aircrew availability and provide crews visibility over monthly flying activities. AMC and AMC-gained aircrews (except those on standby at home station) will have an SRT established on their flight orders.

Scheduled Takeoff Time—Takeoff time is established in the schedule or OPORD. For air aborts and diversions, this will be engine shut down time (or arrival in the blocks if engine shutdown is not scheduled) plus authorized ground time. Early deviation does not apply to aborts or diversions unless the mission is formally rescheduled by current operations.

Significant Meteorological Information (SIGMET)—Area weather advisory issued by an ICAO meteorological office relayed to and broadcast by the applicable ATC agency. SIGMET advisories are issued for tornadoes, lines of thunderstorms, embedded thunderstorms, large hail, severe and extreme turbulence, severe icing, and widespread dust or sand storms. SIGMETs frequently cover a large geographical area and vertical thickness. They are prepared for general aviation and may not consider aircraft type or capability.

Special Assignment Airlift Mission (SAAM)—Funded airlift that cannot be supported by channel missions because of the unusual nature, sensitivity, or urgency of the cargo or that requires operations to points other than the established channel structure.

Stations Time (Air Force)—Normally, one hour prior to take-off for the C-5. Aircrews will have completed their pre-flight duties and be at their crew positions. Passengers will be seated and cargo will be secured.

Tactical Event—Low level routes, NVG operations and threat avoidance approaches/departures.

Tanker Airlift Control Center (618 TACC)—The Air Mobility Command direct reporting unit responsible for planning, allocating, and executing all tanker/airlift missions in support of AMC's Global Reach mission. 618 TACC is the single point of contact for its customers and suppliers and is comprised of the following functions: current operations, command and control, logistics operations, aerial port operations, aeromedical evacuation, flight planning, diplomatic clearances, weather, intelligence, and integrated flight management.

Tanker Task Force (TTF)—Force of tanker aircraft assembled and tasked to perform a specific function.

Theater Patient Movement Requirements Center (TPMRC)—Organization within a specific theater of operations responsible for coordination of intra- and inter-theater patient movement.

Time Out—Common assertive statement used to voice crew member concern when safety may be jeopardized.

Training Mission—Mission executed at the unit level for the sole purpose of aircrew training for upgrade or proficiency. Does not include operational missions as defined in this AFI.

Transportation Working Capital Fund (TWCF)—Formerly known as Defense Business Operations Fund-Transportation (DBOF-T). Part of the Air Force Working Capital Fund (AFWCF). Normally used to cover costs that can be recovered from an air mobility customer. Examples include TDY costs, site surveys of CRG or airlift unit deployment bed down locations, airlift unit level mission planning expenses, and support or contract costs for deployed TWCF units/personnel.

Unilateral—Operations confined to a single service.

Unit Move—Unit relocation in support of a contingency or exercise deployment/redeployment. These moves are made to desired areas of operation or to designated locations, and are made IAW a troop movement schedule.

Zero Fuel Weight—Weight, expressed in pounds, of a loaded aircraft not including wing and body tank fuel. All weight in excess of the maximum zero fuel weight will consist of usable fuel.